

**A REVISION OF THE SHORE-FLY GENUS *CRESSONOMYIA* ARNAUD  
(DIPTERA: EPHYDRIDAE), WITH COMMENTS ON SPECIES THAT HAVE  
BEEN EXCLUDED**

WAYNE N. MATHIS AND TADEUSZ ZATWARNICKI

(WNM) Department of Entomology, NHB 169, P.O. Box 37012, Smithsonian Institution, Washington, D.C. 20013-7012, U.S.A. (e-mail: mathis.wayne@nmnh.si.edu); (TZ) Museum and Institute of Zoology, Polish Academy of Sciences, ul. Wilcza 64, 00-679 Warsaw, Poland, and Department of Biosystematics, University of Opole, ul. Oleska 22, 45-052 Opole, Poland (e-mail: zatwar@uni.opole.pl)

---

*Abstract.*—Five species of the shore-fly genus *Cressonomyia* Arnaud are revised, including *C. bolivia*, n. sp. (Bolivia, La Paz: Tajlihui). The genus is known only from the New World tropics and subtropics and is the sister group to *Peltopsilopa* Cresson. Two species groups are recognized, the *aciculata* group (two species) and the *skimmeri* group (three species). *Psilopa aeneonigra* (Loew), which had been included in *Cressonomyia*, is returned to *Psilopa*. A neotype is designated for *Psilopa aciculata* Loew, the senior synonym for *Plagiops nitidifrons* Cresson (**new synonym**). All species are illustrated and distribution maps are also provided.

*Key Words:* review, Diptera, Ephydridae, shore flies, *Cressonomyia*

---

This revision treats species of *Cressonomyia* Arnaud, which are known only from the New World. The species of *Cressonomyia* have never been treated comprehensively, although Cresson (1942, 1946) provided a review, including keys, in his treatments of the Nearctic and Neotropical shore-fly faunas. The primary objectives of this paper are to revise the species and to present a phylogenetic context for the genus *Cressonomyia* within the tribe Psilopini Cresson, subfamily Discomyzinae Acloque. We recharacterize *Cressonomyia* and describe and illustrate several characters of the male terminalia that have not been reported or analyzed previously. These structures are described and illustrated for all known species and are included in the phylogenetic analysis.

Although the generic concept of *Cressonomyia* has remained relatively stable

since its description, the genus-group nomenclature was confused for decades because of preoccupied names. The generic status was first recognized in 1918 as the genus *Plagiops* Cresson, a preoccupied genus-group name (Townsend 1911). Cresson recognized his nomenclatural lapse and proposed the replacement name of *Plagiopsis* Cresson, which, unfortunately, was also preoccupied (Brauer and Bergenstamm 1889). Both *Plagiops* and *Plagiopsis* were first proposed for tachinid flies, and Arnaud (1958), a specialist on Tachinidae, ultimately corrected the nomenclatural oversights by suggesting *Cressonomyia* as the valid, replacement name. As E. T. Cresson, Jr. described most of the species included in the genus, it is appropriate that the generic name be a patronym to honor and recognize him. The type species for *Plagiops* is *P. nitidifrons* Cresson, which automatically

became the type species for the replacement names.

Thus far eight names are available for species of *Cressonomyia* (Mathis and Zatzwarnicki 1995). Loew (1862) described the first species, *Psilopa aciculata*, from specimens collected in Cuba, and the second species, *Ephygrobia metallica* Schiner (1868), was later found to be conspecific with *C. aciculata* (Cresson 1925). Loew (1878) also described the third species, *Psilopa aeneonigra*, from specimens collected in Texas, and like the first species he named, it too became a senior synonym when the fourth species, *Psilopa fulvipennis* Hine (1904) from Louisiana, was discovered to be conspecific with *C. aeneonigra* (Cresson 1942). The correct generic status of *Psilopa aeneonigra* and *P. fulvipennis* is reported in this paper. Cresson named the other four species, although none was described in *Cressonomyia*. The four species in their original generic combination are: *Plagiops linei* (Cresson 1922); *Psilopa meridionalis* (Cresson 1918); *Plagiops nitidifrons* (Cresson 1918); and *Psilopa skinneri* (Cresson 1922). Aside from catalog entries (Wirth 1965, 1968; Mathis and Zatzwarnicki 1995) and Cresson's synopses (1942, 1946), there are no other substantive papers on *Cressonomyia*.

*Cressonomyia* has always been associated with the genus *Psilopa* and related genera, which were usually recognized as the tribe Psilopini (Cresson 1942, 1946; Wirth 1965, 1968; Mathis and Zatzwarnicki 1995). We continue with that precedent, as all morphological evidence (see key and diagnosis below) substantiates that tribal placement. We also adhere to Zatzwarnicki's (1992) characterization of Psilopini, which excludes genera that are more closely related to *Discomyza* Meigen as a separate tribe, Discomyzini Acloque. Both Discomyzini and Psilopini are tribes in the subfamily Discomyzinae (Mathis and Zatzwarnicki 1995).

#### METHODS AND MATERIALS

The descriptive terminology, with the exceptions noted in Mathis (1986) and Mathis

and Zatzwarnicki (1990a), follows that published in the *Manual of Nearctic Diptera* (McAlpine 1981). Because specimens are small, usually less than 3.5 mm in length, study and illustration of the male terminalia required use of a compound microscope. We have followed the terminology for most structures of the male terminalia that other workers in Ephydriidae have used (see references in Mathis 1986, and Mathis and Zatzwarnicki 1990a, b), such as pre- and postsurstylus. Zatzwarnicki (1996) has suggested that the pre- and postsurstylus correspond with the pre- and postgonostylus and that the subepandrial plate is the same as the medandrium. The terminology for structures of the male terminalia is provided directly on Figs. 2–15. The species descriptions are composite and not based solely on the holotypes. One head and two venational ratios that are used in the descriptions are defined below (all ratios are based on three specimens: the largest, smallest, and one other). Gena-to-eye ratio is the genal height measured at the maximum eye height divided by the eye height. Costal vein ratio: the straight line distance between the apices of  $R_{2+3}$  and  $R_{4+5}$ /distance between the apices of  $R_1$  and  $R_{2+3}$ . M vein ratio: the straight line distance along vein M between crossveins (dm-cu and r-m)/distance apicad of dm-cu.

Distribution maps were made using ESRI ArcView® GIS 3.2. Longitude and latitude coordinates were obtained for the locality where each specimen was collected and entered into a Microsoft Excel® spreadsheet. If available, the longitude and latitude were obtained directly from the specimen labels. For specimen labels that did not have longitude and latitude, gazetteers and maps were used to determine the geographical coordinates. The geographic coordinate spreadsheet was converted to a tab delimited text file and imported into ESRI ArcView. The specimen locales were plotted on a world land projection, presented within ESRI ArcView layouts and exported as encapsulated postscript (EPS) files.

The phylogenetic analysis was performed



with the assistance of Hennig86<sup>®</sup>, a computerized algorithm that produces cladograms by parsimony. Character data were polarized primarily using outgroup procedures. Although autapomorphies were not included in the cladistic analysis (they were made inactive), which would skew the consistency and retention indices, we listed them on the cladogram and included them as part of generic treatments and phylogenetic considerations to document the monophyly of the lineages, particularly at the species-group level.

Although many specimens for this study are in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), we also borrowed and studied numerous specimens that are deposited in the following museums:

- ANSP Academy of Natural Sciences of Philadelphia, Pennsylvania, USA.
- AMNH American Museum of Natural History, New York, USA.
- BYU Brigham Young University, Provo, Utah, USA.
- CMP Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA.
- INBIO Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica.
- MCZ Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA.
- MNBL Museo Nacional de Historia Natural, La Paz, Bolivia.
- NMW Naturhistorisches Museum, Wien, Austria.
- OHSU Ohio State University, Columbus, Ohio, USA.

SYSTEMATICS

TRIBE PSILOPINI CRESSON

Psilopini Cresson 1925: 241. Type genus: *Psilopa* Fallén 1823.

Heringinae Enderlein 1934: 191. Type genus: *Heringium* Enderlein 1934 (= *Clanoneurum* Becker 1903).

Clanoneurinae Enderlein 1936: 168. Type genus: *Clanoneurum* Becker 1903.

Diagnosis.—*Head*: Fronto-orbital setae reclinate and proclinate; reclinate fronto-orbital seta usually inserted behind larger, proclinate fronto-orbital seta. Pedicel bearing a long, spinelike seta near anterodorsal margin. Face usually smooth, if finely striate the longest facial seta at least as long as its distance from opposite seta; medial facial area and lower facial margin without setae; facial setae inserted in more or less vertical series, parallel with parafacial; subcranial cavity small.

*Thorax*: Prescutellar acrostichal setae large (subequal to posterior dorsocentral seta), inserted widely apart (distance between subequal to that between either prescutellar and the posterior dorsocentral seta on the same side) and usually in front of intra-alar seta; presutural or sutural dorsocentral seta inconspicuous or absent. R stem vein lacking setulae on dorsum; vein R<sub>2+3</sub> well separated from costal vein; crossvein dm-cu nearly straight or shallowly arched, not angulate.

*Abdomen*: Presurstylus well developed; postsurstylus lobate, lacking a postsurstylar process; subepandrial plate well developed, usually narrow; pregonite moderately well developed, usually bearing 2–3 long, apical setulae; aedeagus simple, tubular; phallopodeme generally hemispherical to triangular with a well-developed, extended keel in lateral view; ejaculatory apodeme lacking; hypandrium well developed, usually pocketlike.

KEY TO NEW WORLD GENERA OF  
PSILOPINI CRESSON

- 1. Prescutellar acrostichal setae lacking . . . . . 2
- Prescutellar acrostichal setae well developed . . . . . 3
- 2. Only inner vertical seta present. Lateral margins of abdomen sharp . . . . *Trimerina* Macquart
- Both inner and outer vertical setae present. Lateral margins of abdomen rounded. revolute . . . . . *Trimerinoides* Cresson
- 3. Vein R<sub>2+3</sub> close to costa beyond end of vein R<sub>1</sub>; crossvein dm-cu with sharp angle at middle . . . . . *Clanoneurum* Becker
- Vein R<sub>2+3</sub> well separated from costa; crossvein dm-cu mostly straight or shallowly arched, not angulate . . . . . 4

4. Base of wing blackish, contrasted with remainder of wing; knob of halter blackish brown to black . . . . . 5  
 – Base of wing concolorous with rest of wing, usually hyaline or very lightly tinged; knob of halter whitish to yellowish . . . . . 6
5. Scutellum greatly enlarged, extended far over and above abdomen . . . . . *Peltopsilopa* Cresson  
 – Scutellum normally developed, not extended far over abdomen . . . . . *Cressonomyia* Arnaud
6. Face with transverse striae . . . . .  
 . . . . . *Leptopsilopa* Cresson  
 – Face smooth, lacking transverse striae (transverse striae in *Ceropsilopa coquilletti* Cresson, which has entirely yellow legs) . . . . . 7
7. Pedicel conical, broader apically, without dorsoapical lobe, dorsoapical spine weak (at most  $\frac{1}{3}$  as long as 1st flagellomere); 1st flagellomere from 2–4 $\times$  as long as high . . . . .  
 . . . . . *Ceropsilopa* Cresson  
 – Pedicel short and subtriangular, with dorsoapical lobe and bearing well-developed dorsoapical spine (at least half as long as 1st flagellomere); 1st flagellomere at most twice as long as high . . . . . *Psilopa* Fallén

#### Genus *Cressonomyia* Arnaud

*Plagiops* Cresson 1918: 53. Type species: *Plagiops nitidifrons* Cresson 1918, original designation; preoccupied, Townsend 1911.

*Plagiopsis* Cresson 1934: 201 [replacement name for *Plagiops* Cresson; preoccupied, Brauer and Bergenstamm 1889]; 1942: 126–127 [Nearctic fauna]; 1944: 162 [discussion]; 1946: 158–161 [review of Neotropical fauna].

*Cressonomyia* Arnaud 1958: 24 [replacement name for *Plagiopsis* Cresson].—Wirth 1965: 743 [Nearctic catalog]; 1968: 11 [Neotropical catalog].—Mathis and Zatwarnicki 1995: 34–35 [world catalog].

Diagnosis.—Small to moderately small shore flies, body length 1.50–2.35 mm; microtomentum generally sparse or lacking, appearing subshiny to shiny; mostly black species.

*Head*: Head in lateral view with antenna inserted at dorsal  $\frac{1}{3}$ ; frons conspicuously wider than long; fronto-orbital setae reclinate and proclinate but sometimes weakly developed; pseudopostocellar setae well de-

veloped, subequal to outer vertical seta, orientation mostly proclinate and slightly divergent; both inner and outer vertical setae well developed; vertex acutely creased; posterior ocelli situated immediately before creased vertex, ocelli forming isosceles triangle. Antenna with 1st flagellomere longer than pedicel; scape not exerted; arista with 4–8 dorsal rays. Facial vestiture variable, surface mostly flat and plain, lacking pits and transverse microrugosity or striae; 1 strong facial seta, mesocline; palpus black; proboscis normally developed, not elongate.

*Thorax*: Generally black to deep bluish black, microtomentum sparse to lacking; supra-alar seta absent; prescutellar acrostichal seta well developed; scutellum only slightly wider than long, disc sparsely setulose; basal scutellar seta over  $\frac{1}{2}$  length of apical seta; anepisternum with 2 large setae. Wing mostly hyaline to faintly yellowish except for blackish base; crossveins not darkened; vein  $R_{2+3}$  extending normally to costal margin, lacking stump vein; R stem vein bare of setulae dorsally. Knob of halter black. Femora black; forebasitarsus whitish yellow to yellow, only apical 1–2 tarsomeres blackish.

*Abdomen*: Generally bare of microtomentum, shiny, blackish; tergites 3–4 long, 5th tergite very short and lacking prominent, dorsally erect setae along posterior margin. Male terminalia: epandrium in posterior view an inverted, rounded U (open ventrally), in lateral view wider subventrally; cerci lunate to rodlike, narrower dorsally, sometimes with a mediodorsal point; presurstylus much longer than wide, bearing 2–3 setae anterobasally; postsurstylus longer than wide, generally as an inverted L, directed anteroventrally or ventrally, with variously developed medial lobes or processes; subepandrial plate wider than long, usually narrowed medially and with each lateral extension slightly enlarged; pregonite bearing 3 long setulae; aedeagus longer than wide, wider basally in ventral view, in lateral view with distal portion directed posteroventrally, posteroapical mar-



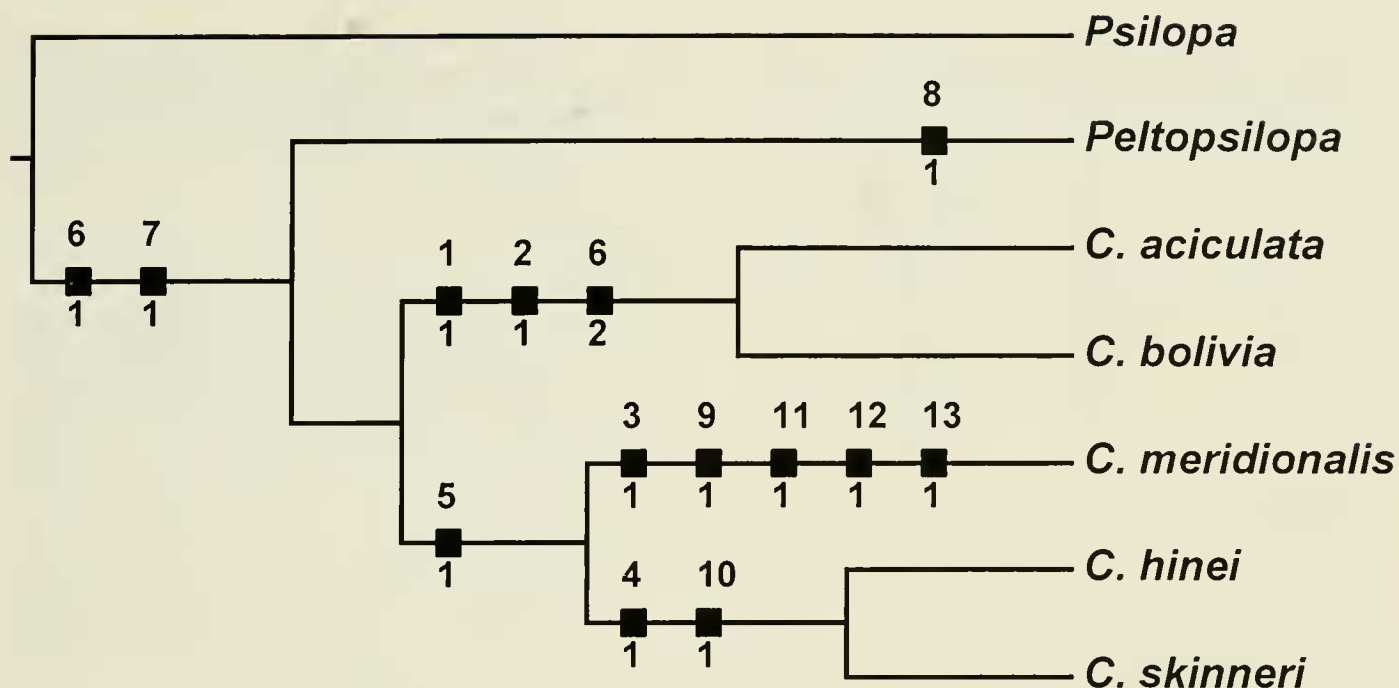


Fig. 1. Cladogram depicting hypothetical cladistic relationships among species of *Cressonomyia*.

gin irregular, sometimes with a subapical process dorsally; phallapodeme in lateral view more or less triangular, keel sometimes irregular, asymmetrical; hypandrium U-shaped, membranous from posterior margin to center, in lateral view shallow to moderately deep, pocketlike.

**Discussion.**—*Cressonomyia* is similar and evidently closely related to *Peltopsilopa*. Both genera share at least two synapomorphies: 1. base of wing darkened; 2. knob of halter blackish brown to black; and 3. postsurstylus angulate, L-shaped. *Peltopsilopa* differs from *Cressonomyia* in having a greatly enlarged scutellum that extends posteriorly over most of the abdomen. Both genera are also only known from the New World, especially tropical areas. Although *Peltopsilopa* is distinctive and readily distinguished because of the enlarged scutellum and the setulose gonite (bearing setulae in addition to the three long, apical setulae), it should perhaps be recognized as a derived but included lineage within *Cressonomyia*.

Excluded from the genus, based on evidence accumulated in this study, are *Psilopa aeneonigra*, including its junior synonym *Psilopa fulvipennis*, which Wirth (1965) transferred from *Psilopa* to *Cressonomyia* without comment. We confirm the synonymy of these two names, first sug-

gested by Cresson (1942), after determining that the two holotypes are conspecific. Wirth probably made the generic transfer on the basis of the slightly darkened wing base of *P. aeneonigra*, similar to *Cressonomyia*, but which otherwise differs from species included in the genus. The knob of the halter, for example, is white, not blackish brown to black, as in *Cressonomyia*, and structures of the male terminalia also differ, sharing similarities especially in the shape of the subepandrial plate, postsurstylus, and hypandrium with those of *Psilopa*.

**Phylogenetic analysis of species.**—In the presentation on species-level relationships that follows, the characters used in the analysis are noted first. Each character is immediately followed by a discussion to explain its states and to provide perspective and any qualifying comments about that character. After presentation of the information on character evidence, an hypothesis of the cladistic relationships is presented and briefly discussed. The cladogram (Fig. 1) is the primary mode to convey relationships, and the discussion is to supplement the cladogram and is intended only to complement the latter. In the discussion of character data, a "0" indicates the state of the outgroup; a "1" or "2" indicates the derived states. Characters 3, 8, 9, 11, 12, and

Table 1. Matrix of characters and taxa used in the cladistic analysis of *Cressonomyia* (numbers for characters correspond with those used in the text).

| Taxa                   | Characters     |                  |          |
|------------------------|----------------|------------------|----------|
|                        | 00000<br>12345 | 000011<br>678901 | 11<br>23 |
| <i>Psilopa</i>         | 00000          | 000000           | 00       |
| <i>Peltopsilopa</i>    | 00000          | 111000           | 00       |
| <i>C. aciculata</i>    | 11000          | 210000           | 00       |
| <i>C. bolivia</i>      | 11000          | 210000           | 00       |
| <i>C. hinei</i>        | 00011          | 110010           | 00       |
| <i>C. skinneri</i>     | 00011          | 110010           | 00       |
| <i>C. meridionalis</i> | 00101          | 110101           | 11       |

13, which are autapomorphies for various species, were made inactive (I) for the analysis so that they do not figure into the calculation of the consistency index. The numbers used for characters in the presentation are the same as those on the cladogram, and the sequence is the same as noted in the character matrix (Table 1). The genus *Psilopa*, which is the nominate genus for the tribe Psilopini, was the outgroup in our phylogenetic analysis.

#### CHARACTERS USED IN THE PHYLOGENETIC ANALYSIS

(running count in parenthesis)

##### Head:

- 1(1). Size of fronto-orbital setae: (0) comparatively large, well developed; (1) minute (a synapomorphy for the *aciculata* group).
- 2(2). Plane of face and frons: (0) face and frons forming an obtuse angle in lateral view; (1) face and frons nearly flat in lateral view, largely bare, shiny (a synapomorphy for the *aciculata* group).
- 3(3). Number of arisal rays: (0) arista bearing 8 dorsal rays; (1) arista bearing 4–5 dorsal rays (an autapomorphy for the *meridionalis* group).
- 4(4). Face: (0) polished or smooth; (1) bearing microtomentum as a vertical stripe or more generally microsculptured (a synapomorphy for the *hinei* group).
- 5(5). Height of face: (0) face long, height twice that of frons; (1) face shorter, height 1.5× that of frons (a synapomorphy for *hinei* and *meridionalis* groups).

##### Thorax:

- 1(6). Coloration of basal portion of wing: (0) wing completely unicolorous; (1) darkened portion limited, at most occupying basal ¼ of cell  $cua_1$  (a synapomorphy for *Cressonomyia* and *Peltopsilopa*); (2) darkened base more extensive, occupying ⅓–½ base of cell  $cua_1$  (a synapomorphy for the *aciculata* group).
- 2(7). Color of knob of halter: (0) whitish to yellowish; (1) brown to blackish brown (a synapomorphy for *Cressonomyia* and *Peltopsilopa*).
- 3(8). Size of scutellum: (0) normally developed, trapezoidal or triangular; (1) greatly enlarged, extended over much of abdomen, beetlelike (an autapomorphy for *Peltopsilopa*).

##### Abdomen:

- 1(9). Shape of the presurstylus: (0) lobate, forming subbasal notch, 3 setulae in notch along basomedial portion; (1) presurstylus elongate, narrow, almost parallel sided, shallowly curved, and lacking medial notch and setulae (an autapomorphy for the *meridionalis* group).
- 2(10). Shape of postsurstylus: (0) with a shallow or very short spur; (1) with an elongate, narrow spur (a synapomorphy for the *hinei* group).
- 3(11). Shape of phallapodeme: (0) triangular, with a moderately long projection or projection lacking; (1) with an elongate anteroventral projection (an autapomorphy for the *meridionalis* group).
- 4(12). Shape of gonite: (0) nearly as wide as long, lobate; (1) gonite slender, much longer than wide (Figs. 67–68; an autapomorphy for the *meridionalis* group).



5(13). Shape of hypandrium: (0) usually pocketlike in lateral view; (1) hypandrium flattened (an autapomorphy for the *meridionalis* group).

Using the implicit enumeration (ie\*) option of Hennig86, which is an exhaustive search, a single most parsimonious tree was generated from the analysis of the 13 characters. The cladogram has a length of eight steps and consistency and retention indices of 1.0.

As indicated on the cladogram (Fig. 1), the genus *Cressonomyia* is divided into three basal sublineages to which we have accorded species-group status. The first basal sublineage comprises the *aciculata* group, which includes *C. aciculata* and a new species, *C. bolivia*, and its monophyly is established by characters 1, 2, and 6. The second species group, which is sister group to the third (supported by character 5), is the *hinei* group and includes *C. hinei* and *C. skinneri*. The monophyly of the *hinei* group is established by the long, narrow spur on the postsurstylus (character 10; Figs. 43, 57) and the microtomentose or microsculptured face (character 4). The last lineage, the *meridionalis* group, is monotypic, and its monophyly is well corroborated by five characters that we have identified (characters 3, 9, 11, 12, and 13).

KEY SPECIES OF *CRESSONOMYIA* ARNAUD AND OTHER SPECIES THAT HAVE BEEN INCLUDED

- 1. Knob of halter white to yellowish (genus *Psilopa*) . . . . . *Psilopa aeneonigra* Loew
- Knob of halter blackish brown to black (genus *Cressonomyia*) . . . . . 2
- 2. Fronto-orbital setae minute; face and frons nearly flat in lateral view, largely bare, shiny; face long, height twice that of frons; darkened base of wing more extensive, occupying 1/3–1/2 base of cell *cua*<sub>1</sub> . . . . . 3
- Fronto-orbital setae well developed; face shorter, height 1.5× that of frons; vestiture of face and frons variable; darkened base of wing less extensive, at most occupying basal 1/4 of cell *cua*<sub>1</sub> . . . . . 4
- 3. Mesonotum smooth, polished, at most weakly aciculate; scutellum arched . . . . .  
 . . . . . *C. bolivia*, new species

- Mesonotum microsculptured, subopaque, granulose, or aciculate; scutellum flat . . . . .  
 . . . . . *C. aciculata* (Loew)
- 4. Face and mesonotum microsculptured . . . . .  
 . . . . . *C. hinei* (Cresson)
- Face and mesonotum smooth, shiny or slightly microtomentose . . . . . 5
- 5. Face polished; arista with 4–5 dorsal rays . . . . .  
 . . . . . *C. meridionalis* (Cresson)
- Face with vertical, microtomentose stripe medially; arista with 8 rays . . . *C. skinneri* (Cresson)

THE *ACICULATA* GROUP

Remarks.—Of the two species groups we recognize in *Cressonomyia*, the monophyly of the *aciculata* group is more evident. Synapomorphies that characterize the *aciculata* group and establish its monophyly are (plesiomorphies in parenthesis): (1) fronto-orbital setae minute (elsewhere in *Psilopini*, the fronto-orbital setae are relatively large); (2) face and frons nearly flat in lateral view, largely bare, shiny (usually the frons and face in lateral view are on more angulate planes); (3) darkened base of wing more extensive, occupying 1/3–1/2 base of cell *cua*<sub>1</sub>. Having a darkened base is a synapomorphy, and we interpret the more extensively darkened base, as in this species group, to be the more derived state in the transformation series of this character.

*Cressonomyia aciculata* (Loew)  
(Figs. 2–16)

- Psilopa aciculata* Loew 1862: 142.—Williston 1896: 394 [revision]; 1897: 4 [list, Brazil, Grenada, St. Vincent]; 1908: 304 [figure of wing].—Coquillett 1900: 260 [fauna, Puerto Rico].—Ragués 1908: 317 [fauna, Cuba].—Johnson 1913: 86 [fauna, Florida]; 1919: 447 [fauna, Jamaica].—Gowdey 1926: 88 [fauna, Jamaica].—Wolcott 1924: 231 [list, Puerto Rico]; 1936: 383 [list, Puerto Rico].
- Plagiops aciculata*: Cresson 1925: 244 [generic combination].—Curran 1928: 62 [fauna, Puerto Rico].
- Plagiopsis aciculata*: Cresson 1942: 127 [generic combination]; 1946: 160–161 [review, Neotropical fauna, Colombia, Costa Rica, Cuba, Guatemala, Haiti, Ja-

maica, Mexico, Nicaragua, Panamá, Puerto Rico, Trinidad, Venezuela].

*Cressonomyia aciculata*: Wirth 1965: 742 [Nearctic catalog; generic combination]; 1968: 11 [Neotropical catalog].—Mathis and Zatwarnicki 1995: 34 [world catalog].

*Ephygrobia metallica* Schiner 1868: 242.—Cresson 1925: 244 [synonymy, designation of a lectotype].

*Plagiops nitidifrons* Cresson 1918: 54.—Curran 1928: 32 [fauna, St. Croix].—Hendel 1930: 141 [fauna, Paraguay].  
**New synonym.**

*Plagiopsis nitidifrons*: Cresson 1938: 30 [generic combination, fauna, Brazil]; 1946: 159–160 [review, Neotropical fauna, Bolivia, Costa Rica, Guyana, Panamá].

*Cressonomyia nitidifrons*: Arnaud 1958: 24 [generic combination].—Wirth 1968: 11 [generic combination, Neotropical catalog].—Mathis and Zatwarnicki 1995: 35 [world catalog].

**Description.**—This species is distinguished from congeners by the following combination of characters: Small to moderately small shore flies, body length 1.50–2.35 mm.

**Head:** Fronto-orbital setae minute. Arista bearing 8 dorsal rays. Face and frons in lateral view only slightly arched, almost straight; face bare, shiny.

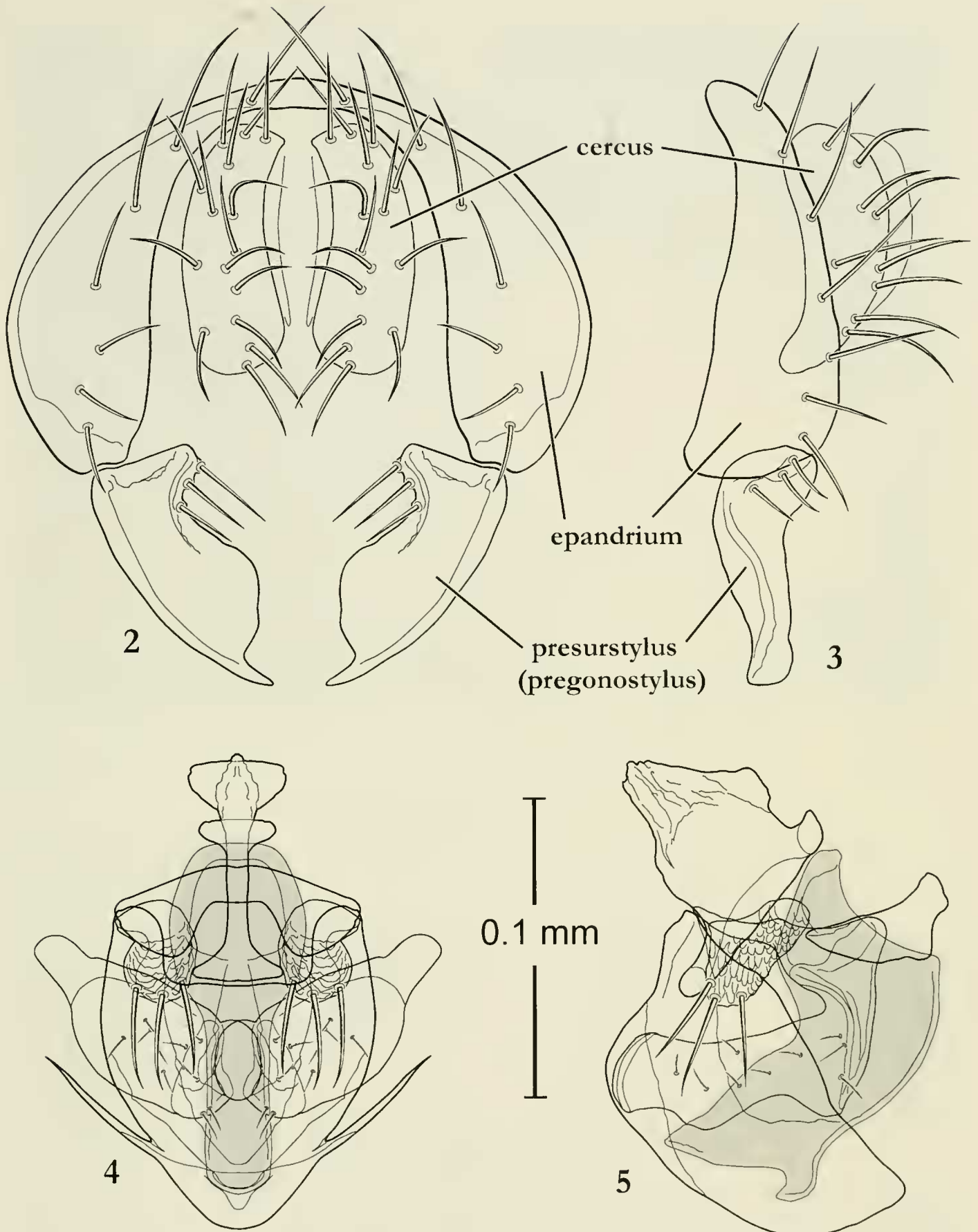
**Thorax:** Mesonotum microsculptured, subopaque, granulose, or aciculate. Wing with costal vein ratio 0.87–0.95; M vein ratio 0.56–0.60.

**Abdomen:** Male terminalia (Figs. 2–15): Epandrium broadly U-shaped in posterior view (Fig. 2), much wider ventrolaterally than dorsally; cerci almost rodlike, shallowly curved (Fig. 2); presurstylus in posterior view (Fig. 2) incised medially, forming subbasal notch, 3 setulae in notch, thereafter ventrally swollen medially to slightly more than width at base then tapered and recurved to fingerlike apex, in lateral view wider basally and slightly recurved posteriorly, very gradually tapered to blunt ven-

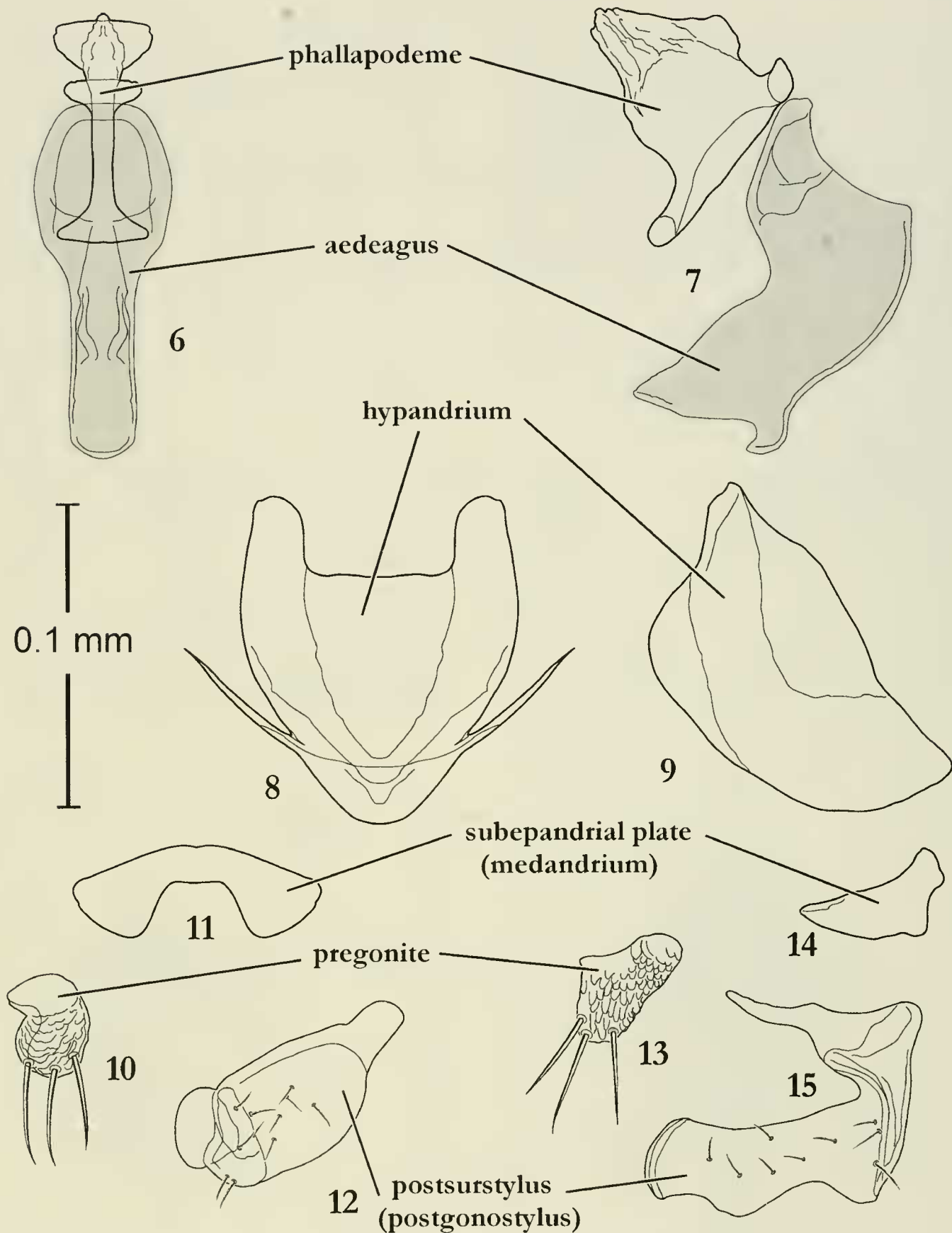
tral apex; postsurstylus in lateral view (Figs. 5, 15) deeply bilobed, posterior lobe longer and wider, width somewhat even throughout length, bearing numerous setulae, posterior margin sinuous, anterior lobe shorter, tapered to point; pregonite (Figs. 4–5, 10, 13) moderately long, slightly tapered, broadly rounded apically, bearing 3 well-developed setulae apically; aedeagus in ventral view with slight bulge basally, thereafter parallel sided on apical half, apex broadly rounded, in lateral view with medial margin broadly incised, apex with short, curved, pointed lobe at ventral corner; phallapodeme (Figs. 6–7) with keel wide basally, extended portion irregularly triangular in lateral view; subepandrial plate in ventral view (Fig. 11) wider than long, narrowed medially, each lateral portion slightly flared, in lateral view (Fig. 14) narrowly triangular, pointed ventrally; hypandrium in lateral view (Figs. 5, 9) more deeply pocketlike, in ventral view broadly V-shaped (Figs. 4, 8), anteriorly with very slender, pointed posterolateral projections.

**Type material.**—The neotype male of *Psilopa aciculata* Loew, here designated to preserve stability and make more universal the use of this name, is labeled “CUBA. Holquín: Santa Lucia (3 km N), 22 Feb 1992, MvonTschirnhaus/NEOTYPE ♂ *Psilopa aciculata* Loew by Mathis & Zatwarnicki [red].” The neotype is double mounted (glued to a paper triangle), is in excellent condition, and is deposited in the USNM. We have designated a neotype for this species because no specimen from the type series is available for designation as a lectotype in either the MCZ or the Humboldt Universität (Berlin, Germany) where Loew’s collections were deposited. There is a specimen in the MCZ that is labeled “18 [handwritten]/Loew Coll./Type? [red; “?” handwritten]/*Cressonomyia aciculata* (Lw.) WWirth ’61 [black submargin; handwritten except for “WWirth”],” but this specimen does not have the silver square that was used to identify Poey’s material that Osten Sacken acquired and eventually sent to Loew (Osten Sacken 1903). The lack of a





Figs. 2–5. Structures of the male terminalia of *Cressonomyia aciculata* (Cuba. Holguín: Holguín, north). 2. Epandrium, cerci, and presurstylus, posterior view. 3. Same, lateral view. 4. Aedeagus (shaded), phallapodeme, postsurstylus, pregonite, and hypandrium, ventral view. 5. Same, lateral view.



Figs. 6–15. Structures of the male terminalia of *Cressonomyia aciculata* (Cuba. Holguín: Holguín, north). 6, Aedeagus and phallapodeme, ventral view. 7, Same, lateral view. 8, Hypandrium, ventral view. 9, Same, lateral view. 10, Pregonite, ventral view. 11, Subepandrial plate, ventral view. 12, Postsurstylus, ventral view. 13, Pregonite, lateral view. 14, Subepandrial plate, lateral view. 15, Postsurstylus, lateral view.

silver square or any other indication that this was a specimen of the type series is undoubtedly the reason why the red "Type?" was put on this specimen, indicating the

questionable status of this specimen. For these reasons and to stabilize the use of this name, we have selected the male specimen, as noted, as the neotype.



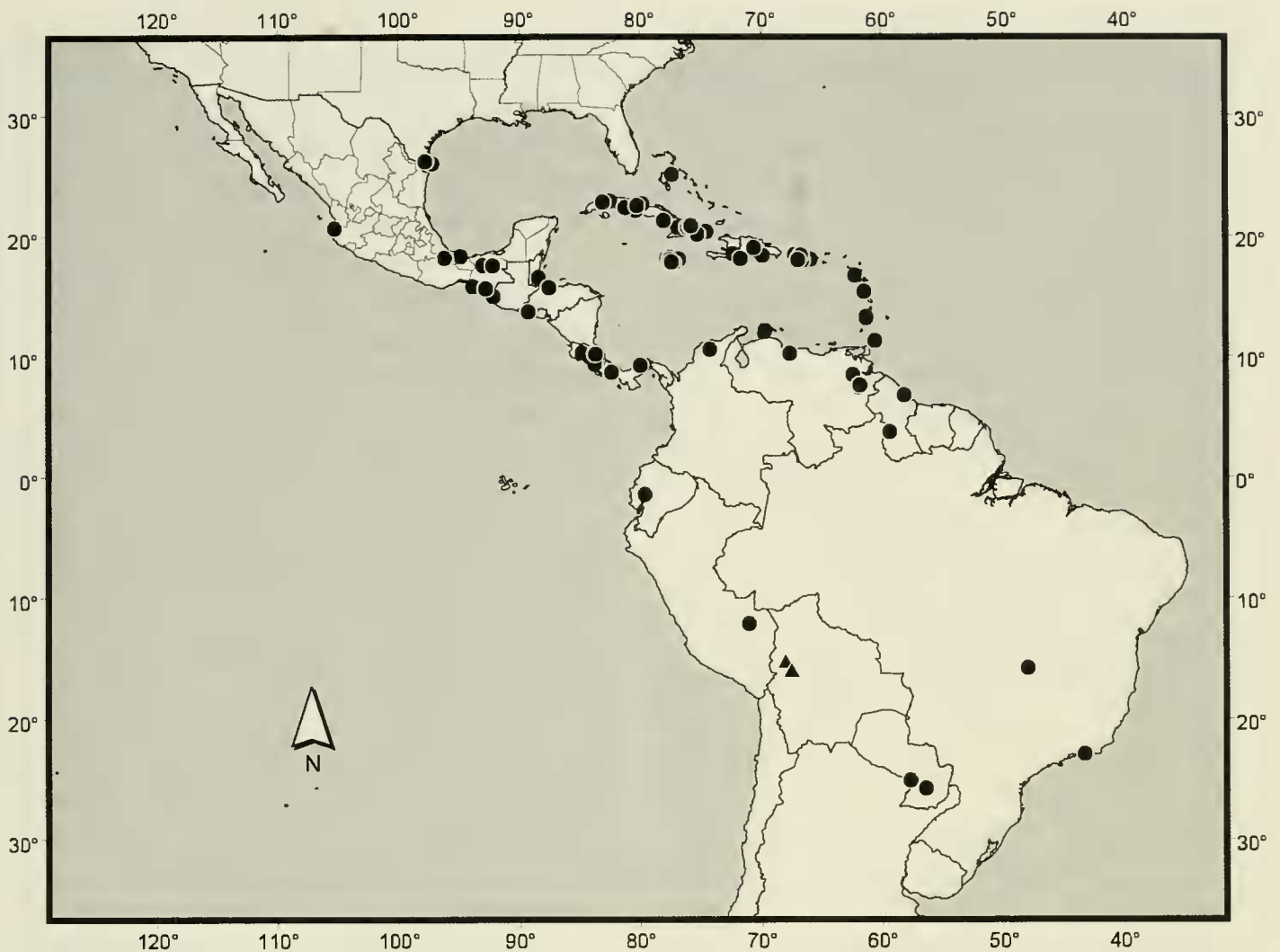


Fig. 16. Distribution map for *Cressonomyia aciculata* (dots) and *C. bolivia* (triangles).

The lectotype female of *Ephygrobia metallica* Schiner (designated by Cresson 1925: 244) is labeled "TYPE [red]/Lindig 1864 Venezuela/metallica Alte Sammlung/Ephygrobia metallica Schin./Plagiops aciculata (Loew) det. Cresson, 1924." The lectotype is in good condition and is deposited in the NMW.

The holotype male of *Plagiops nitidifrons* Cresson is labeled "Guacimo 6VI09 [6 Jun 1909] C[osta]Rica PPCalvert/♂/TYPE 6127 [red; number handwritten]/TYPE Plagiops nitidifrons E T CRESSON JR [red; species name handwritten; "TYPE" written on left margin of label]." The holotype is double mounted (minuten in a thin, rectangular piece of cardboard), is in excellent condition, and is deposited in the ANSP (6127). The type locality, Guacimo, is in the province of Limón.

Other specimens examined.—Nearctic:

UNITED STATES. *Texas*. *Cameron*: Boca Chica, R. H. Beamer, C. Michener, J. Rosen, W. Stephen (1 ♂; USNM); Brownsville, 8 Apr 1945, D. E. Hardy (1 ♀; USNM); Harlingen, 9 Mar 1945, D. E. Hardy (1 ♀; USNM).

Neotropical: *BAHAMAS*. New Providence: Nassau, 28 Jun (2 ♂, 2 ♀; MCZ).

*BELIZE*. *Stann Creek*: Placentia Lagoon, Rum Point, 4–5 Nov 1987, D. and W. N. Mathis (3 ♀; USNM).

*BRAZIL*. *Distrito Federal*: Brasilia, Lago Paranoa, 4–5 Oct 1974, L. Knutson (1 ♀; USNM). *Rio de Janeiro*: Rio de Janeiro, 3 Aug–Sep 1934, 1939, H. Souza Lopes (1 ♂, 2 ♀; ANSP).

*COLOMBIA*. *Magdalena*: Aracataca (10°35.5'N, 74°11.5'W), Feb 1912, Ujhelyi (1 ♀; ANSP).

*COSTA RICA*. *Alajuela*: Alajuela (945 m), 15 Sep 1909, P. P. Calvert (1 ♂; ANSP);

Caño Negro (10°53.6'N, 84°47.4'W; 20 m), 14–27 Apr 1994, K. F. Flores (2 ♂, 3 ♀; INBIO); Chomogo area (10°18'N, 84°47'W; 1620 m), 13 Jun 1973, T. L. Erwin, G. F. Hevel (1 ♂, 1 ♀; USNM). *Cartago*: Peralta (9°58'N, 83°37'W; 332 m), 7 Aug 1909, P. P. Calvert (1 ♂; ANSP). *Guanacaste*: Hacha, Finca el Oro (5 km S de Hacienda Alemania; 11°01.4'N, 85°27.5'W; 400 m), 14–19 Apr 2002, D. Briceño (8 ♂, 11 ♀; INBIO); Pitilla (9 km S Santa Cecilia; 10°59.5'N, 85°25.8'W; 700 m), Feb–7 Apr 1989, 1993, P. Ríos (6 ♂, 8 ♀; INBIO). *Heredia*: Finca Naranja Valenciana (2 km S Pueblo Nuevo, Sarapiquí; 10°28'N, 84°07'W; 90 m), 31 Jan 1993, M. Ortiz (2 ♀; INBIO); La Virgen de Sarapiquí (10°23.7'N, 84°08.5'W), 9–24 Apr 1993, M. Ortiz (1 ♀; INBIO); Santo Domingo, INBio Parque (9°58.4'N, 84°5.6'W), 18 Feb 2003, W. N. Mathis (1 ♂, 1 ♀; USNM). *Limón*: Batán, 16 Jun 1951, L. L. Cartwright (1 ♂; USNM); Guácimo (10°13'N, 83°41'W; 110 m), 6 Jun 1909, P. P. Calvert (1 ♂; paratype; ANSP). *Puntarenas*: Estación Agujas (8°32.2'N, 83°25.5'W; 300 m), 19–24 Mar 1997, A. Azofeifa (1 ♀; INBIO); Estación Cabuya (9°35.3'N, 85°05.9'W; 50 m), 22 Mar 1997, F. Alvarado (1 ♀; INBIO); Estación Carara (9°46.5'N, 84°31.6'W; 200 m), Feb 1990, R. Zúñiga (1 ♂, 2 ♀; INBIO); Estación Quebrada Bonita (9°46'N, 84°36.5'W; 50 m), 21 Mar–21 Apr, 1989, R. Zúñiga (1 ♂, 1 ♀; INBIO); Estación Sirena, Corcovado (8°28.8'N, 83°35.5'W), 21 Mar–21 Apr 1992, Z. Fuentes (1 ♀; INBIO); Monteverde, 26 Mar 1987, W. E. Steiner (13 ♂, 21 ♀; USNM); Rancho Quemado (8°40.8'N, 83°34'W; 200 m), Apr 1992, K. Flores (1 ♀; INBIO). *San José*: La Caja (8 km W San José), 28 Apr, H. Schmidt (2 ♀; USNM); Pedregoso (9°22'N, 83°43'W), D. L. Rounds (1 ♀; ANSP).

CUBA. *Camagüey*: Camagüey, 3 Dec 1917, J. V. McGuire (1 ♂; USNM). *Cienfuegos*: Soledad, Jardín Botánico (22°7.5'N, 80°19.2'W), Jan–13 Dec 1927, 1994, C. T. Brues, W. N. Mathis, G. Salt (3 ♂, 6 ♀; MCZ, USNM). *Granma*: Cayamas, 26 Jan,

E. A. Schwarz (1 ♂; USNM). *Guantánamo*: Baracoa (30 km SE), 26 Feb 1992, M. von Tschirnhaus (1 ♂; USNM); Guantánamo, 10 Nov 1914, H. Skinner (1 ♂, 4 ♀; ANSP); Pt. Barrios, 3–14 Mar 1905 (1 ♀; ANSP); San Carlos Est., 4–8 Oct 1913 (1 ♂; ANSP). *Havana*: Puerto Escondido, 26 Apr 1983, W. N. Mathis (1 ♀; USNM). *Holguín*: Holguín, north, Feb 1992, M. von Tschirnhaus (3 ♂, 3 ♀; USNM); Santa Lucía (3 km N), 22 Feb 1992, M. von Tschirnhaus (1 ♀; USNM). *Isla de Pinos*: Mar, C. W. Metz (1 ♂, 2 ♀; MCZ, USNM). *Matanzas*: Palpite (1 km NE), 2 May 1983, W. N. Mathis (1 ♀; USNM). *Oriente*: Herradura (20°40'N, 76°48'W), C. W. Metz (1 ♂; MCZ); Santiago de Cuba (20°45'N, 76°2'W), 23 Feb 1992, M. von Tschirnhaus (2 ♂, 2 ♀; USNM). *Pinar del Río*: Soroa (2 km NW; 22°48.6'N, 83°1.0'W), 4–5 Dec 1994, W. N. Mathis (1 ♀; USNM). *Santa Clara*: Soledad, 1–8 Jun 1939, C. T. Parsons (1 ♂, 1 ♀; MCZ, USNM).

DOMINICA. Layou River mouth, 9 Jan 1965, W. W. Wirth (1 ♂; USNM). Springfield Plantation, 18–22 Jul 1978, G. C. Steyskal (2 ♂, 5 ♀; USNM).

DOMINICAN REPUBLIC. *Distrito Nacional*: Ciudad Trujillo (6 km W; = Santo Domingo), 16–20 Dec 1955, J. Maldonado Capriles (1 ♀; USNM). *La Vega*: El Río (9.5 km E; 19°0.9'N, 70°33.5'W; 980 m), 6 May 1995 (1 ♀; USNM); Río Camu (3.5 km NW La Vega; 19°13.7'N, 70°35.2'W; 100 m), 10 May 1995, W. N. Mathis (2 ♂, 10 ♀; USNM); Valle del Río, 28 Dec 1955, J. Maldonado Capriles (2 ♀; USNM). *Pedernales*: Cabo Rojo (23.5 km N; 18°06'N, 71°38'W; 540 m), 13–19 Jul 1990, L. Masner, J. Rawlins, C. Young (1 ♀; CMP).

ECUADOR. *Los Rios*: Quevedo (40 km S), 11 Jul 1975, J. Cohen, Peterson, Thorn-dal (1 ♂; USNM).

EL SALVADOR. San Salvador, 14 Jun 1958, L. J. Bottimer (1 ♀; USNM).

GRENADA. *St. Andrew*: La Force Bridges (12°07.6'N, 61°39.8'W), 19 Sep 1996, W. N. Mathis (2 ♀; USNM).

GUYANA. Georgetown (6°48.6'N, 58°08.6'W), 20–29 Aug 1997, W. N. Math-



is (1 ♂; USNM); Georgetown, Atkinson Airport Road, 2 Jun 1965, S. M. Gaud, L. F. Martorell (1 ♀; USNM). Karanambo, Rupununi River (ox bow; 3°45.1'N, 59°18.6'W), 2 Apr 1994, W. N. Mathis (9 ♂, 8 ♀; USNM).

HAITI. (1 ♂, 1 ♀; USNM).

HONDURAS. Lancetilla (15°42'N, 87°28'W), Aug, Stadelmann (1 ♀; MCZ).

JAMAICA. *Clarendon*: Barnswell Beach (17°45.1'N, 77°08.5'W), 13 May 1996, D. and W. N. Mathis, H. Williams (4 ♂, 4 ♀; USNM); Farquhars Beach (17°50.9'N, 77°22.8'W), 9 May 1996, D. and W. N. Mathis, H. Williams (3 ♂, 4 ♀; USNM); Jackson Bay (17°44.7'N, 77°12.6'W), 13 May 1996, D. and W. N. Mathis, H. Williams (3 ♂, 5 ♀; USNM); Portland Cottage (17°45.4'N, 77°11'W), 13 May 1996, D. and W. N. Mathis, H. Williams (1 ♂, 3 ♀; USNM); Portland Cottage (1 km S; 17°45.8'N, 77°12.6'W), 13 May 1996, D. and W. N. Mathis, H. Williams (1 ♂, 1 ♀; USNM); Salt River (4 km N; 17°52.1'N, 77°09.5'W), 13 May 1996, D. and W. N. Mathis, H. Williams (1 ♀; USNM); Toll Gate (7.7 km S; 17°58'N, 77°22.3'W), 9 May 1996, D. and W. N. Mathis, H. Williams (1 ♂, 1 ♀; USNM). *Manchester*: Batterssea (17°13'N, 77°29'W), Feb 1910, R. Thaxter (1 ♂; ANSP); Mandeville, Feb 1910, R. Thaxter (1 ♀; ANSP); near Mandeville (18°03.5'N, 77°31.9'W), 15 Apr–7 May 1996, 2000, D. and W. N. Mathis, H. Williams (12 ♂, 24 ♀; USNM); near Warwick (17°54.1'N, 77°25.5'W), 7 May 1996, D. and W. N. Mathis, H. Williams (1 ♀; USNM). *St. Andrew*: Irishtown (5 mi SW; via road), 7 Dec 1975, G. F. Hevel (1 ♂; USNM); Ferry River, 13 May 1941, E. Chapin (1 ♀; USNM); Hardwar Gap, 10 Mar 1970, T. Farr, W. W. Wirth (1 ♂; USNM). *St. Catherine*: Fresh River at Ferry, 22 Jul 1962, T. Farr, O. S. Flint (1 ♀; USNM). *St. Elizabeth*: Balaclava (18°10'N, 77°39'W), R. Thaxter (1 ♀; MCZ); Black River (18°01.4'N, 77°51.1'W), 11 May 1996, D. and W. N. Mathis, H. Williams (3 ♂, 2 ♀; USNM); Elim (18°07.1'N, 77°40.5'W), 10 Apr 2000, W. N. Mathis (1

♂, 2 ♀; USNM); Maggoty Falls (18°08.2'N, 77°45.1'W), 18 Apr 2000, W. N. Mathis (1 ♀; USNM).

MEXICO. *Chiapas*: Boca de Ciela (17 km S Puerto Arista), 18 May 1985, A. Freidberg, W. N. Mathis (1 ♀; USNM); Cascadas de Agua Azul (62 km S Palenque), 7 May 1985, W. N. Mathis (1 ♂, 1 ♀; USNM); Finca Prusia (33 km S Jaltenango; 1,000 m), 10–12 May 1985, W. N. Mathis (1 ♀; USNM); Union Juárez (9 km S), 23 Apr 1983 (1 ♂, 2 ♀; USNM). *Jalisco*: Puerto Vallarta, 5 Oct 1984, G. E. Bohart (2 ♂; BYU). *Tabasco*: Teapa (8 km SW), 6 May 1985, W. N. Mathis (1 ♀; USNM). *Veracruz*: Ciudad Aleman, 3 May 1985, W. N. Mathis (2 ♂, 2 ♀; USNM); Fortin de las Flores, 2 May 1985, W. N. Mathis (1 ♂; USNM); Ocotal Chico (600 m), 4–5 May 1985, W. N. Mathis (1 ♂; USNM).

MONTSERRAT. Trinidad, 29 Jun 1905, A. Busck (1 ♀; USNM).

PANAMA. *Canal Zone*: Coraza, 1–6 Mar 1911, A. Busck (1 ♂, 1 ♀; ANSP); Paraíso, 3–7 Feb 1911, A. Busck (1 ♂, 2 ♀; ANSP); Plantation “Borracho,” 10 Jul 1918, H. F. Dietz, J. Zetek (1 ♀; USNM).

PARAGUAY. Asunción, May 1905, Vezényi (1 ♂, 2 ♀; ANSP). Villarica, Jul 1937, F. Schade (3 ♂, 3 ♀; USNM).

PERU. *Madre de Dios*: Manu, Rio Manu, near Romero, 8 Sep 1988, W. N. Mathis (1 ♂, 3 ♀; USNM).

PUERTO RICO. Aguadilla, Jan 1899, A. Busck (2 ♀; USNM). Arecibo (beach; 18°28.7'N, 66°42'W), 23 Sep 1995, D. and W. N. Mathis (2 ♀; USNM). Arroyo, Feb 1899, A. Busck (1 ♀; USNM). Guánica (18°N, 66°54'W; Santa Rita), 12 May 1965, S. M. Gaud (5 ♀; USNM). Henry Bks, 19 Nov 1952, F. S. Blanton (2 ♀; USNM). Mayaguez, 21–23 Jun 1915 (1 ♀; ANSP). Playa de Guayanilla (18°0.4'N, 66°46.1'W), 19 Sep 1995, D. and W. N. Mathis (2 ♀; USNM). Utuado, Jan 1899, A. Busck (1 ♀; USNM). Yabucoa (18°03'N, 65°52'W), 14 May 1965, S. M. Gaud (1 ♀; USNM).

ST. VINCENT. *St. Andrew*: Buccament Bay (near beach; 13°11'N, 61°16'W), 8 Jun

1991, D. and W. N. Mathis (1 ♀; USNM). *St. Patrick*: Cumberland Bay (near beach; 13°16'N, 61°16'W), 28 Mar–10 Jun 1989, 1991, D. and W. N. Mathis (2 ♂, 2 ♀; USNM).

TOBAGO. *St. John*: Charlotteville (beach; 11°19.5'N, 60°32.9'W), 16–18 Apr 1994, D. and W. N. Mathis (1 ♂; USNM). Charlotteville (5 km S; 11°19'N, 60°34'W), Hermitage River and beach, 22 Apr–10 Jun 1993, 1994, W. N. Mathis (2 ♂, 5 ♀; USNM); Parlatuvier (creek; 11°17.9'N, 60°35'W), 20 Apr 1994, W. N. Mathis (2 ♂, 4 ♀; USNM); Speyside (1 km NW; Doctor River; 11°18'N, 60°32'W), 12–13 Jun 1993, W. N. Mathis (3 ♂, 4 ♀; USNM). *St. Paul*: Argyle Falls (11°15'N, 60°35'W), 21 Apr 1994, W. N. Mathis (5 ♂, 4 ♀; USNM); Delaford, Kings Bay (11°16'N, 60°32.8'W), 13 Jun 1993, W. N. Mathis (2 ♂, 4 ♀; USNM); Roxborough (6 km NNW; 11°16'N, 60°35.4'W), 20 Apr 1994, W. N. Mathis (7 ♀; USNM).

TRINIDAD. *St. Andrew*: Valencia (1 km W; 10°39'N, 61°13'W), Aripo River, 20 Jun 1993, W. N. Mathis (6 ♂, 3 ♀; USNM).

VENEZUELA. *Aragua*: Maracay (NW at km 16), 14 Mar 1982, G. F. and J. F. Hevel (6 ♂, 9 ♀; USNM). *Bolivar*: El Miamo (10 km SW), 20 Mar 1982, G. F. and J. F. Hevel (1 ♀; USNM); Guasipati (7.6 km SE), 22 Mar 1982, G. F. and J. F. Hevel (2 ♂; USNM); Upata (19 km SE), 20 Mar 1982, G. F. and J. F. Hevel (2 ♀; USNM). La Piedrita, 16 Nov 1911, S. Brown (1 ♀; ANSP).

Distribution (Fig. 16).—*Nearctic*: USA (AL?, TX). *Neotropical*: Bahamas, Belize, Brazil (Distrito Federal, Rio de Janeiro), Colombia (Magdalena), Costa Rica (Alajuela, Cartago, Guanacaste, Limón, Puntarenas, San José), El Salvador, Guyana, Honduras, Mexico (Chiapas, Jalisco, Tabasco, Veracruz), Panamá, Paraguay, Peru, Trinidad and Tobago, Venezuela, West Indies (Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Montserrat, Puerto Rico, St. Vincent).

Remarks.—We found considerable intraspecific variation in the degree of microsculpturing of the mesonotum and in the

convexity of the scutellum of this species. Cresson (1946: 159–162) used these characters to distinguish between *C. aciculata* and his *C. nitidifrons*. Our attempts to use these characters proved futile, given the variation, and when we examined structures of the male terminalia, we quickly discovered that these two species are essentially identical. Thus, our observations reveal that there is intraspecific variation in the microsculpturing and scutellar convexity but that structures of the male terminalia are consistent. *Cressonomyia aciculata* and *C. nitidifrons* are conspecific, and their names are synonyms with the former being senior.

Although primarily occurring in the Neotropical Region, we have examined specimens of this species from southern Texas. Cresson (1942) reported a specimen from Alabama, which we have not confirmed and thus did not include on the distribution map of this species (Fig. 16).

#### *Cressonomyia bolivia* Mathis and Zatwarnicki, new species

(Figs. 17–30)

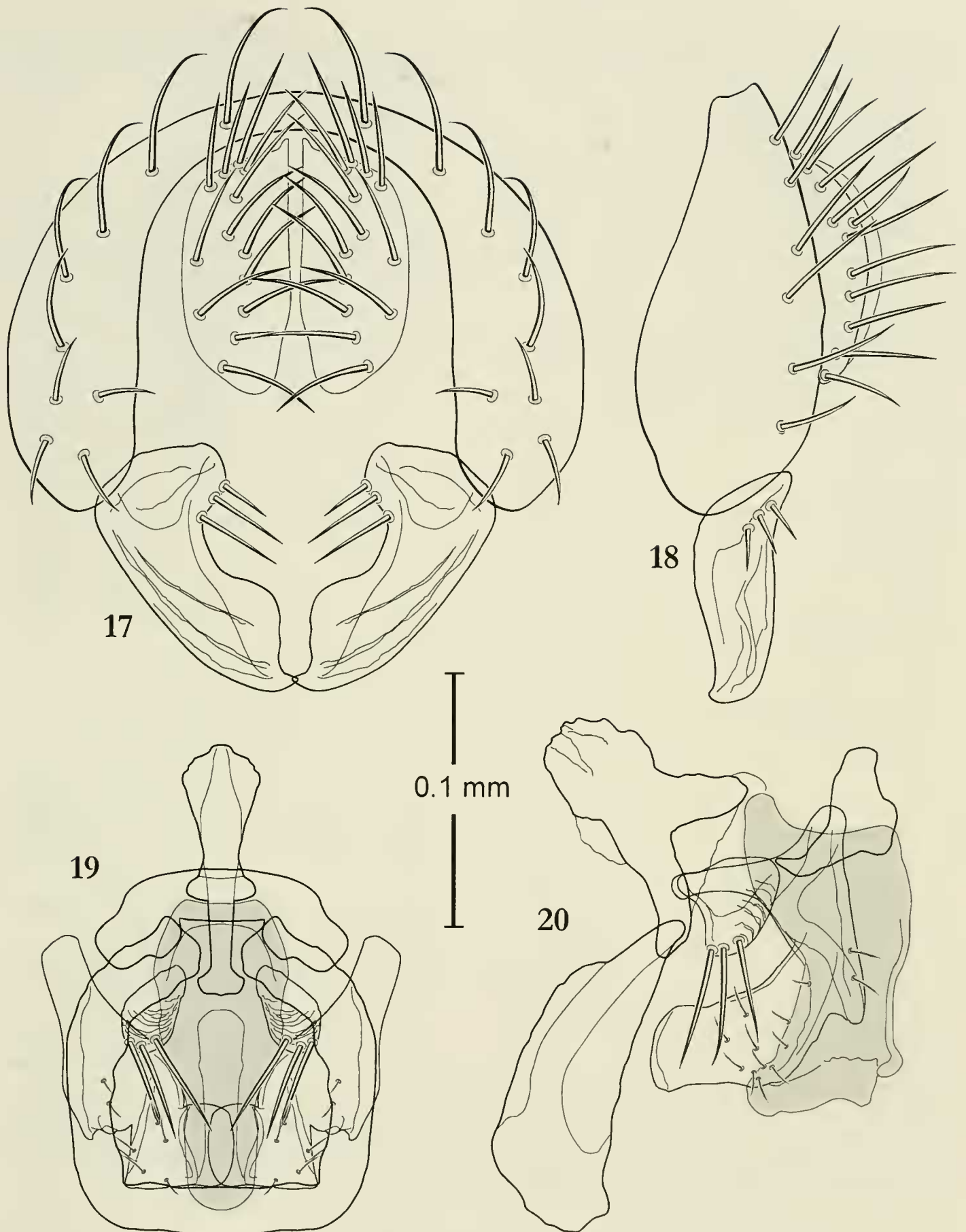
Description.—This species is distinguished from congeners, especially of the *aciculata* group, by the following combination of characters: Small to moderately small shore flies, body length 1.50–1.90 mm.

*Head*: Fronto-orbital setae minute. Arista bearing 8 dorsal rays. Face and frons in lateral view only slightly arched, almost straight; face bare, shiny.

*Thorax*: Mesonotum microsculptured, subopaque, granulose, or aciculate. Wing with costal vein ratio 0.97–1.05; M vein ratio 0.62–0.67.

*Abdomen*: Male terminalia (Figs. 17–30): Epandrium broadly U-shaped in posterior view (Fig. 17), much wider ventrolaterally than dorsally; cerci almost rodlike (Fig. 17), more rounded laterally, medial margin nearly straight; presurstylus in posterior view (Fig. 17) incised medially, forming subbasal notch, 3 setulae in notch along basomedial portion, thereafter ventrally swollen medially to slightly less than width at base then tapered and recurved to pointed





Figs. 17–20. Structures of the male terminalia of *Cressonomyia bolivia* (Bolivia, La Paz: Tajlihui, 15°40.8'S, 67°41.7'W; 590 m). 17, Epandrium, cerci, and presurstylus, posterior view. 18, Same, lateral view. 19, Aedeagus (shaded), phallapodeme, postsurstylus, pregonite, and hypandrium, ventral view. 20, Same, lateral view.



apex, in lateral view (Fig. 18) wider basally and slightly recurved posteriorly, very gradually tapered to blunt ventral apex; postsurstylus in lateral view (Figs. 20, 30) deeply bilobed, posterior lobe longer and wider than anterior lobe, bearing numerous setulae, slightly angulate, apex bluntly rounded; pregonite (Figs. 19–20, 27, 29) moderately long, slightly tapered, broadly rounded apically, bearing 3 well-developed setulae apically; aedeagus in ventral view (Fig. 19) with slight bulge on basal two-thirds, lateral margin of swollen portion irregularly wavy, thereafter apically parallel sided, apex broadly rounded, in lateral view (Figs. 20, 22) with medial margin deeply sinuous, apex irregularly truncate; phallopodeme with keel moderately wide basally, extended portion trapezoidal in lateral view; subepandrial in lateral view (Fig. 26) tapered to curved, point; hypandrium in lateral view moderately deeply pocketlike, in ventral view subquadrate anteriorly, wider than long, anterior margin nearly flat, with wide posterolateral projections posteriorly, lacking anterior projections.

Type material.—The holotype male is labeled “BOLIVIA. Depto. La Paz[,] Tajlihui, 590 m[,] 15°40.8'S 67°41.7'W[,] 12-iii-2001 [12 Mar 2001], S.D. Gaimari/HOLOTYPE *Cressonomyia bolivia* ♂ W.N. Mathis USNM & Zatwarnicki [red; species name and “& Zatwarnicki” handwritten].” The holotype is double mounted (minuten in a block of plastic), is in excellent condition, and is deposited in the MNBL. Twenty-six paratypes (14 ♂, 12 ♀; MNBL, USNM) bear the same locality label data as the holotype.

Other specimens examined.—Neotropical: BOLIVIA. *La Paz*: Guanay (15°29.8'S, 67°52.7'W; 460 m), 13 Mar 2001, W. N. Mathis (1 ♂; USNM); Guanay (3 km E; 15°30.2'S, 67°52.3'W; 500 m), 14 Mar 2001, W. N. Mathis (2 ♀; USNM).

Distribution (Fig. 16).—Neotropical: Bolivia (La Paz).

Etymology.—The species epithet, *bolivia*, alludes to the country where the type series was collected.

Remarks.—Although this species is now only known from Bolivia, we would expect that it will be found elsewhere at mid-elevational sites.

#### THE *HINEI* GROUP

Remarks.—The *hinei* group, which comprises *C. hinei* and *C. skinneri*, is distinguished from the *aciculata* group or *meridionalis* groups by the following combination of characters (synapomorphies that characterize the *meridionalis* group and establish its monophyly are indicated by an \*): (1) fronto-orbital setae well developed; (2\*) face shorter, height 1.5× that of frons; vestiture of face and frons variable; (3\*) face microsculptured or with vertical microtomentose stripe; (4) darkened base of wing less extensive, at most occupying basal ¼ of cell  $cua_1$ ; and (5\*) postsurstylus with a posterior lobe that is elongate, narrow, spur-like (Figs. 43, 57).

#### *Cressonomyia hinei* (Cresson) (Figs. 31–45)

*Plagiops hinei* Cresson 1922: 135.

*Plagiopsis hinei*: Cresson 1942: 127 [generic combination]; 1944: 162 [correction of lapsus calami in 1942: 127]; 1946: 159 [review, Neotropical fauna].

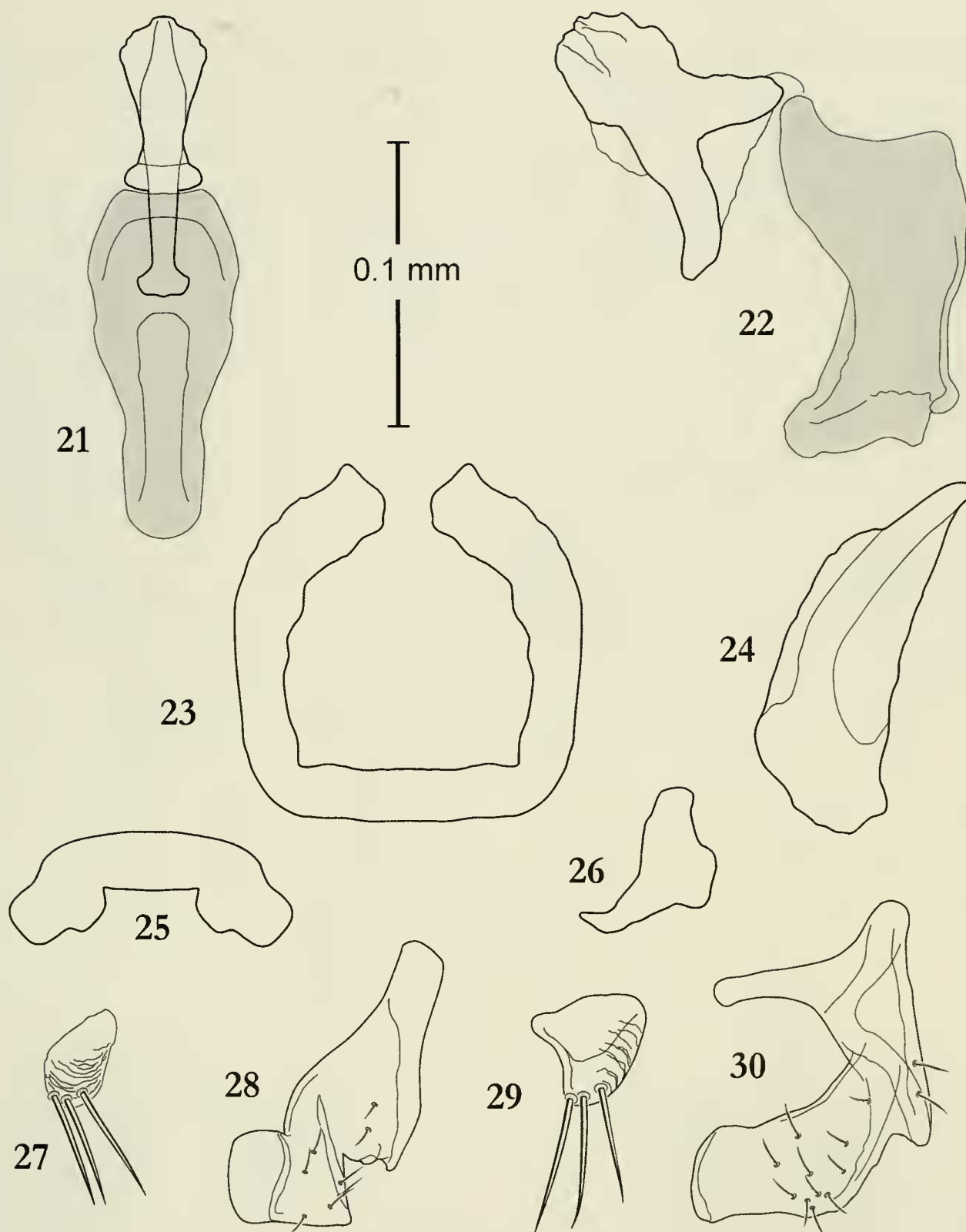
*Psilopa hinei*: Cresson 1942: 127 [generic combination; lapsus calami].

*Cressonomyia hinei*: Wirth 1965: 742 [Nearctic catalog; generic combination].

Description.—This species is distinguished from congeners, especially of the *skinneri* group, by the following combination of characters: Small to moderately small shore flies, body length, 1.75–2.35 mm.

*Head*: Fronto-orbital setae well developed. Arista bearing 7–8 dorsal rays. Face and frons moderately arched in lateral view; face short, height 1.5× that of frons, moderately microsculptured with some iridescent greenish blue coloration.

*Thorax*: Mesonotum moderately microsculptured; darkened base of wing at most occupying basal ¼ of cell  $cua_1$ . Wing with



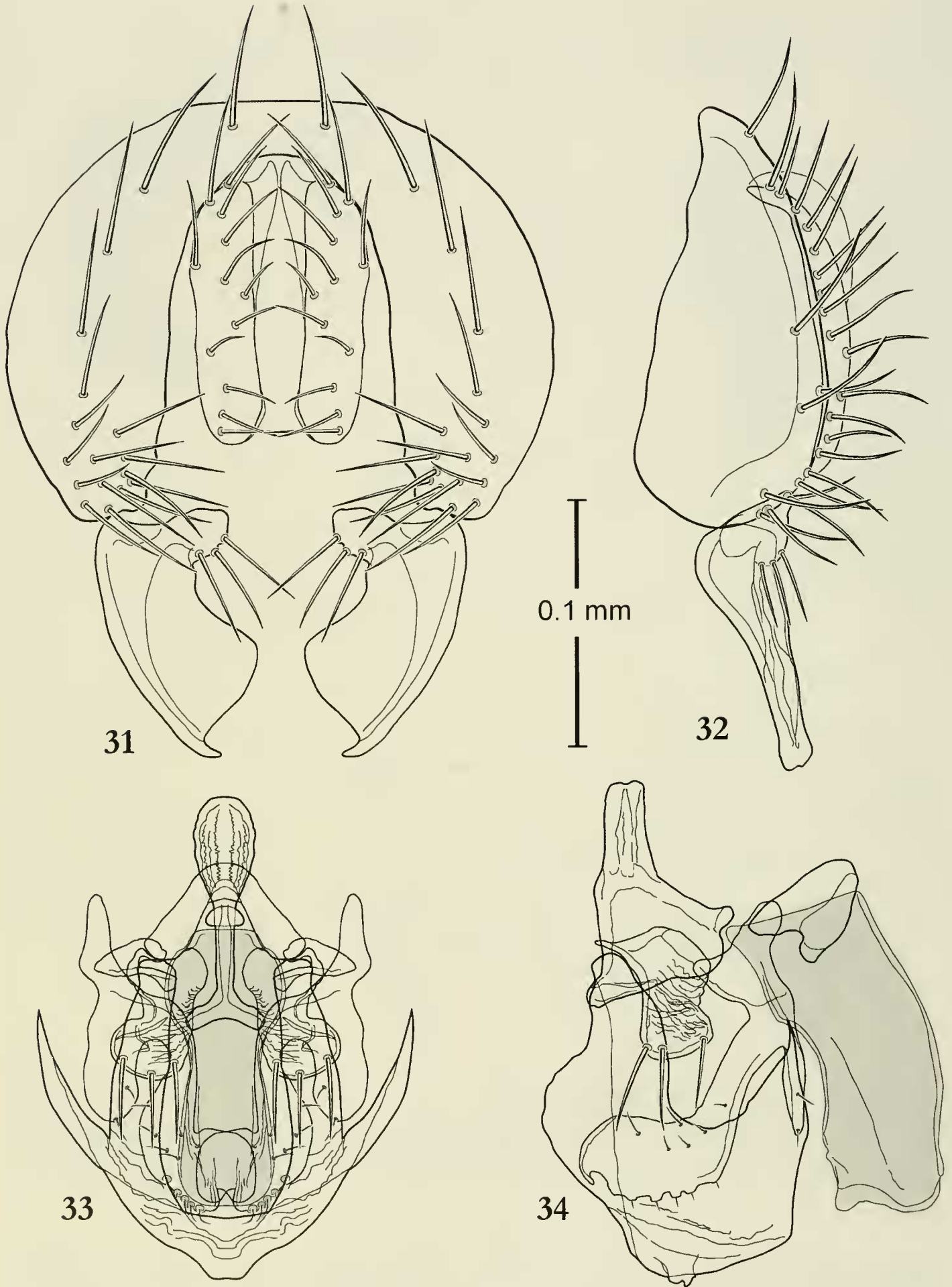
Figs. 21–30. Structures of the male terminalia of *Cressonomyia bolivia* (Bolivia, La Paz: Tajlihui, 15°40.8'S, 67°41.7'W; 590 m). 21, Aedeagus and phallapodeme, ventral view. 22, Same, lateral view. 23, Hypandrium, ventral view. 24, Same, lateral view. 25, Subepandrial plate, ventral view. 26, Same, lateral view. 27, Pregonite, ventral view. 28, Postsurstylus, ventral view. 29, Pregonite, lateral view. 30, Postsurstylus, lateral view.

costal vein ratio 0.96–1.10; M vein ratio 0.62–0.63.

**Abdomen:** Male terminalia (Figs. 31–44): Epandrium broadly U-shaped in posterior view (Fig. 31), rounded, moderately wider ventrolaterally than dorsally; cerci

(Fig. 31) almost rodlike and parallel sided; presurstylus in posterior view (Fig. 31) incised medially, forming a large subbasal notch, 3 setulae in dorsal portion of notch, thereafter ventrally greatly swollen medially to slightly more than width at base then





Figs. 31-34. Structures of the male terminalia of *Cressonomyia hinei* (Mexico, Tabasco: Teapa (8 km SW)). 31, Epandrium, cerci, and presurstylus, posterior view. 32, Same, lateral view. 33, Aedeagus (shaded), phallopodeme, postsurstylus, pregonite, and hypandrium, ventral view. 34, Same, lateral view.

tapered and recurved to short, pronglike apex, in lateral view (Fig. 32) wider basally, thereafter almost straight, very gradually tapered to blunt ventral apex; postsurstylus in lateral view (Figs. 34, 43) trilobed, medial lobe much longer and wider, spatulate on apical half, bearing numerous setulae, posterior margin of spatulate portion with 4–5 setulae from dentate bases, posterior lobe  $\frac{1}{3}$  length of medial lobe, slender, spurlike, bearing 1–2 setulae, anterior lobe very short, broadly triangular; pregonite (Figs. 33–34, 39, 42) moderately long, slightly narrowed medially, thereafter widened to broadly rounded to truncate apex, bearing 3 well-developed setulae apically; aedeagus in ventral view (Figs. 33, 35) with slight bulge on basal third, thereafter apically very slightly flared to mostly parallel sided, apex broadly truncate, in lateral view almost parallel sided, medial margin very shallowly and widely incised at middle third; phallapodeme (Figs. 34, 35–36) with narrowly projected, parallel sided keel; subepandrial plate in ventral view (Fig. 40) broadly inverted V-shaped, in lateral view (Fig. 44) shallowly bilobed, longer lobe slightly tapered, pointed apically; hypandrium in lateral view (Fig. 38) more deeply pocketlike, in ventral view (Figs. 33–37) with anterior, moderately wide, posteriorly curved and pointed processes, posterior processes oriented posteriorly.

Type material.—The holotype female of *Plagiops hinei* Cresson is labeled “P[uer]t[o].Barrios. Guatemala Mch.3-14’ 05 [3–14 Mar 1905]/Holo-TYPE Plagiops HINEI E. T. Cresson Jr [maroon; species name handwritten].” The holotype is double mounted (glued to a narrow, paper triangle), is in excellent condition, and is deposited in OHSU.

Other specimens examined.—Nearctic: UNITED STATES. *Florida. Alachua*: 10 Mar 1955, H. V. Weems, Jr. (1 ♂, 4 ♀; USNM); Gainesville, 23 Feb 1918, J. M. Aldrich (5 ♀; ANSP, USNM). *Broward*: Fort Lauderdale, 26 Jan 1933, A. L. Melander (2 ♂, 5 ♀; ANSP, USNM); Hammondville (26°14’N, 80°12’W), 2 Jun 1953, M.

R. Wheeler (2 ♀; USNM). *Dade*: Royal Palm Park, 22 Apr 1930, A. L. Melander (1 ♀; ANSP). *Hendry*: 7 Dec 1955, R. A. Morse (2 ♀; USNM). *Henry*: Clewiston, 20 Jan 1938, A. L. Melander (1 ♂; USNM). *Highlands*: Highlands Hammock State Park, 31 Mar 1956, H. V. Weems, Jr. (1 ♂; USNM); Sebring, 25 Nov 1954, H. V. Weems, Jr. (1 ♂; USNM). *Miami-Dade*: Paradise Key, 21–28 Feb 1919, H. S. Barber, E. A. Schwarz (1 ♂, 3 ♀; ANSP, USNM). *Okeechobee*: Okeechobee, 25 Jun 1953 (1 ♀; USNM). *Orange*: Orlando, 18 Feb–18 Apr 1918, 1956, J. M. Aldrich, W. W. Wirth (6 ♀; ANSP, USNM). *Osceola*: Kissimmee, 1 Feb 1932, A. L. Melander (2 ♀; ANSP, USNM). *Palm Beach*: Lake Worth, A. T. Slosson (1 ♀; USNM). *Sarasota*: Sarasota, 2 Mar 1937 (1 ♀; USNM).

*Louisiana. Orleans*: New Orleans (near), 1 Jan–23 Feb 1923, 1932, T. F. Hubbell, A. L. Melander (2 ♀; ANSP, USNM).

*Mississippi. Hancock*: Bay St. Louis, 3 Sep 1958 (1 ♀; USNM).

*South Carolina. Clarendon*: Manning, 29–30 May 1914, W. Stone (1 ♀; ANSP).

*Texas. Bexar*: San Antonio, 3 Apr 1942, A. L. Melander (1 ♀; USNM). *Brazoria*: Angleton, 3 Jan 1946, R. H. Beamer (1 ♀; USNM).

Neotropical: BELIZE. *Stann Creek*: Placencia Lagoon, Rum Point, 4–5 Nov 1987, D. and W. N. Mathis (2 ♀; USNM).

COSTA RICA. *Alajuela*: Caño Negro (10°53.6’N, 84°47.4’W; 20 m), 14–27 Apr 1994, K. F. Flores (2 ♂, 3 ♀; INBIO).

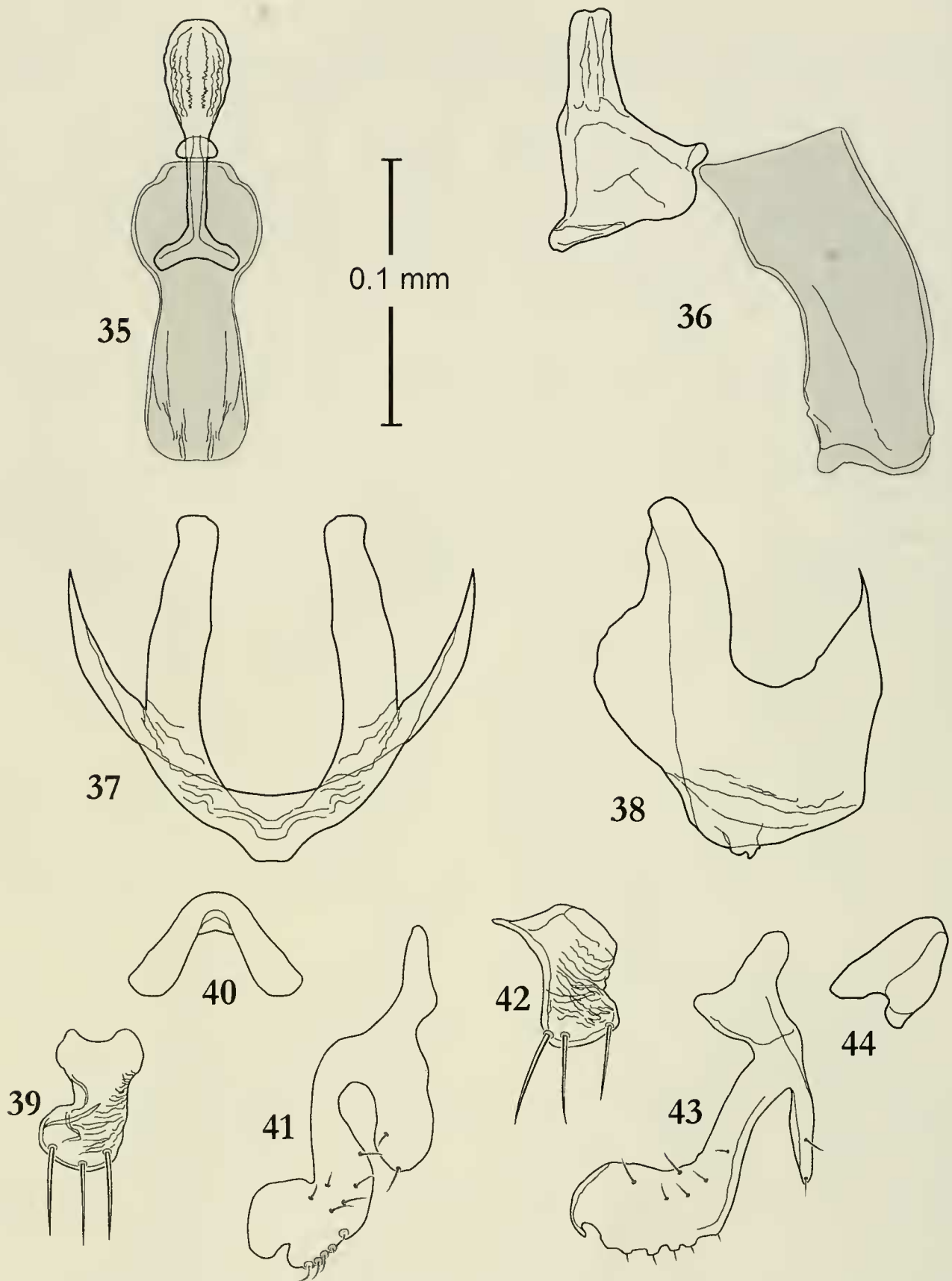
EL SALVADOR. Santa Tecla (12 km NW), Feb 1954, W. B. Heed (1 ♀; USNM).

MEXICO. *Tabasco*: Teapa (8 km SW), 6 May 1985, W. N. Mathis (11 ♂, 20 ♀; USNM). *Veracruz*: Ciudad Aleman, 3 May 1985, W. N. Mathis (2 ♂, 2 ♀; USNM); Tampico, 29 Dec 1908 (1 ♀; ANSP).

PANAMÁ. *Canal Zone*: Coraza, 1 Mar 1911, A. Busck (1 ♀; USNM). *Panamá*: Tocumen, 13 Feb–25 May 1952, 1953, F. S. Blanton (4 ♀; USNM).

Distribution (Fig. 45).—*Nearctic*: USA (FL, LA, MS, SC, TX). *Neotropical*: Belize, Costa Rica (Alajuela), El Salvador,





Figs. 35–44. Structures of the male terminalia of *Cressonomyia linei* (Mexico. Tabasco: Teapa (8 km SW)). 35, Aedeagus and phallapodeme, ventral view. 36, Same, lateral view. 37, Hypandrium, ventral view. 38, Same, lateral view. 39, Pregonite, ventral view. 40, Subepandrial plate, ventral view. 41, Postsurstylus, ventral view. 42, Pregonite, lateral view. 43, Postsurstylus, lateral view. 44, Subepandrial plate, lateral view.

Guatemala, Mexico (Tabasco, Veracruz), Panamá.

Remarks.—In North America, this is the most widespread species, but its distribu-

tion there is primarily confined to the southeastern United States.

The moderately microsculptured face with some iridescent greenish blue color-

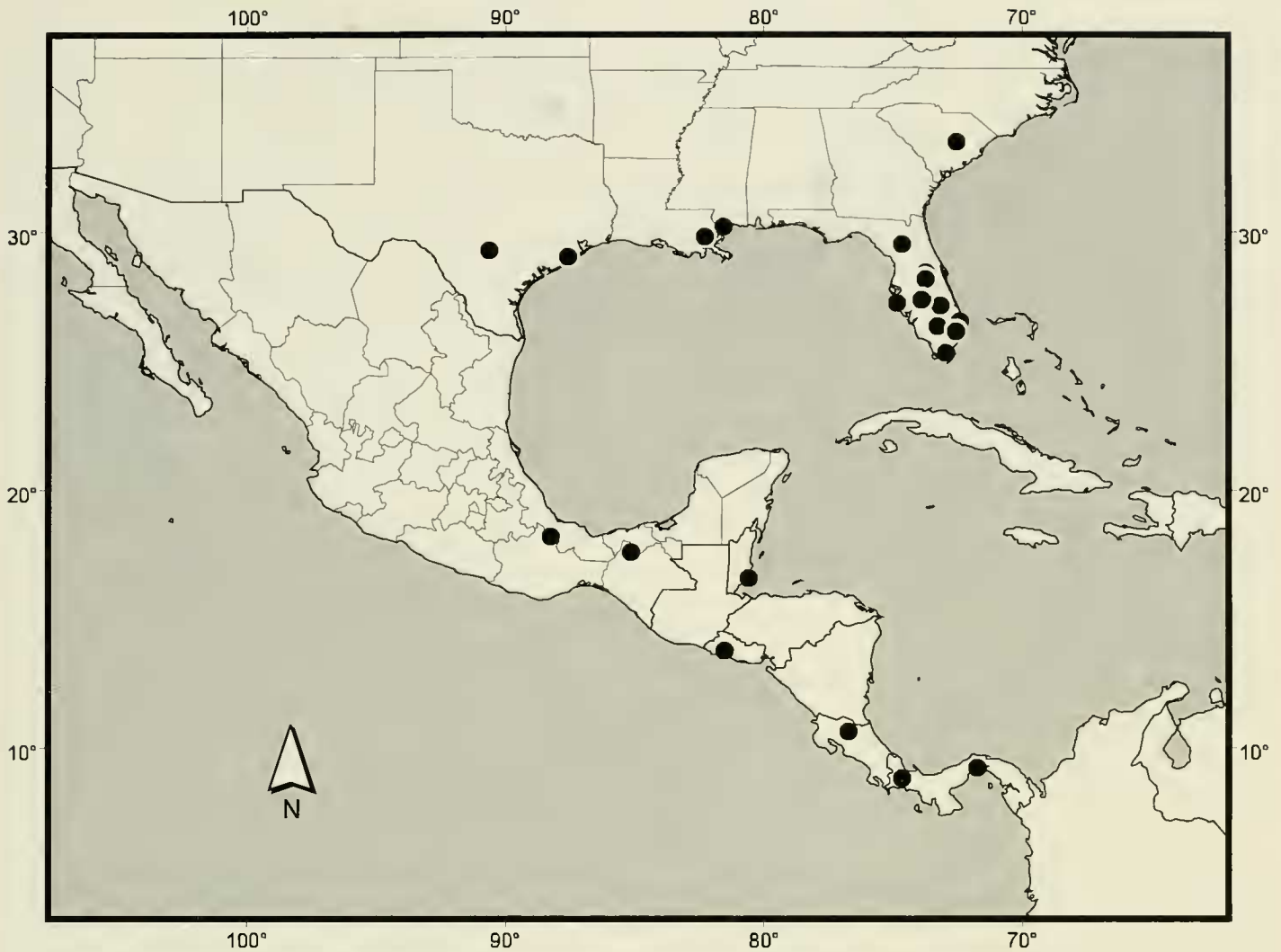


Fig. 45. Distribution map for *Cressonomyia hinei*.

tion distinguishes this species most easily from congeners.

*Cressonomyia skinneri* (Cresson)  
(Figs. 46–58)

*Psilopa skinneri* Cresson 1922: 136.—Wolcott 1936: 383 [list, Puerto Rico].

*Plagiops skinneri*: Cresson 1946: 159 [generic combination].

*Plagiopsis skinneri*: Cresson 1942: 126 [generic combination]; 1946: 158–159 [review, Neotropical fauna, Brazil, Cuba, Panamá, Paraguay, Puerto Rico].

*Cressonomyia skinneri*: Wirth 1965: 742 [Nearctic catalog; generic combination]; 1968: 11 [Neotropical catalog].—Mathis and Zatwarnicki 1995: 35 [world catalog].

**Description.**—This species is distinguished from congeners, especially of the *skinneri* group, by the following combination of characters: Small to moderately

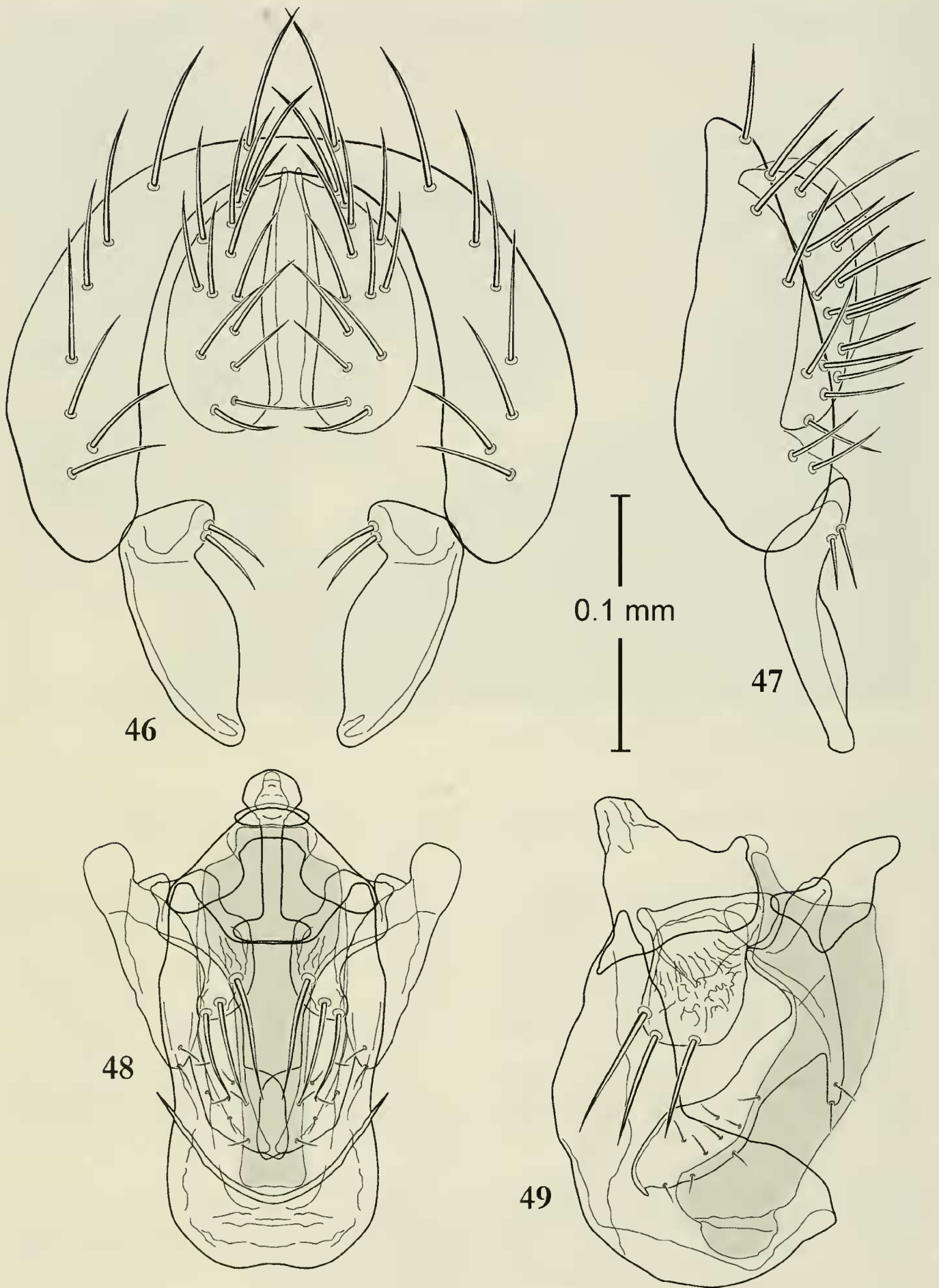
small shore flies, body length 1.65–2.35 mm.

**Head:** Fronto-orbital setae well developed. Arista bearing 8 dorsal rays. Face and frons moderately arched in lateral view; face short, height 1.5× that of frons, with vertical, microtomentose stripe medially; facial setae in minute pits.

**Thorax:** Mesonotum smooth, shiny; darkened base of wing at most occupying basal ¼ of cell  $cua_1$ . Wing with costal vein ratio 0.70–0.78; M vein ratio 0.64–0.7. Tibial apices yellowish.

**Abdomen:** Male terminalia (Figs. 46–57): Epandrium broadly U-shaped in posterior view (Fig. 46), rounded, moderately wider ventrolaterally than dorsally; cerci (Fig. 46) almost rodlike, wider ventrally, lateral margins rounded, medial margin almost straight; presurstylus in posterior view (Fig. 46) incised medially, forming an angulate, moderately deep subbasal notch, 2





Figs. 46–49. Structures of the male terminalia of *Cressonomyia skinneri* (Jamaica, Clarendon: Grantham (18°09.3'N, 77°23.8'W; 340 m)). 46, Epandrium, cerci, and presurstylus, posterior view. 47, Same, lateral view. 48, Aedeagus (shaded), phallapodeme, postsurstylus, pregonite, and hypandrium, ventral view. 49, Same, lateral view.

setulae in dorsal portion of notch, thereafter ventrally shallowly swollen medially to slightly less than width at base then tapered and recurved to short, blunt apex, in lateral view (Fig. 47) much wider basally, thereafter almost straight, very slightly tapered to blunt apex; postsurstylus in lateral view (Figs. 49, 57) somewhat trilobed, medial lobe much longer and wider, slightly spatulate on apical half, bearing numerous setulae, posterior lobe moderately long, narrow, spurlike, bearing 2 setulae, anterior lobe broadly triangular; pregonite (Figs. 48–49, 52) moderately long, in lateral view (Fig. 55) subquadrate, apex truncate, bearing 3 well-developed setulae apically; aedeagus in ventral view (Figs. 48, 550) with basal third slightly swollen, lateral margins of swollen portion almost parallel sided, subquadrate, thereafter almost parallel sided to apex, apex broadly truncate, in lateral view (Figs. 49, 51) with medial margin widely and moderately deeply and irregularly incised, external margin more evenly arched; phallapodeme (Figs. 48–51) with keel wide basally, irregularly and asymmetrically projected, projection longest toward hypandrium; subepandrial plate in ventral view (Fig. 53) shallowly and broadly V-shaped, each arm wider than narrow medial portion, in lateral view (Fig. 56) subquadrate with apical corners slightly produced; hypandrium in lateral view (Fig. 49) more moderately deeply pocketlike, slightly angulate, in ventral view (Figs. 48, 50) with anterior margin symmetrically and shallowly sinuous, moderately wide anteriorly, thereafter posteriorly more or less parallel sided, posterior, subanteriorly with very slender, pointed posterolateral projections.

Type material.—The holotype female of *Psilopa skinneri* Cresson is labeled “Guantanamo Cuba/H. Skinner 10 11 '14 [10 Nov 1914; “10” handwritten]/♂ [sic, specimen is a female]/Holo-TYPE *Psilopa skinneri* E. T. Cresson Jr [red; species name handwritten].” The holotype is double mounted (minuten in a thin, rectangular piece of cardboard), is in fair condition (head miss-

ing), and is deposited in the ANSP (6346). The type locality is in the province of Guantánamo.

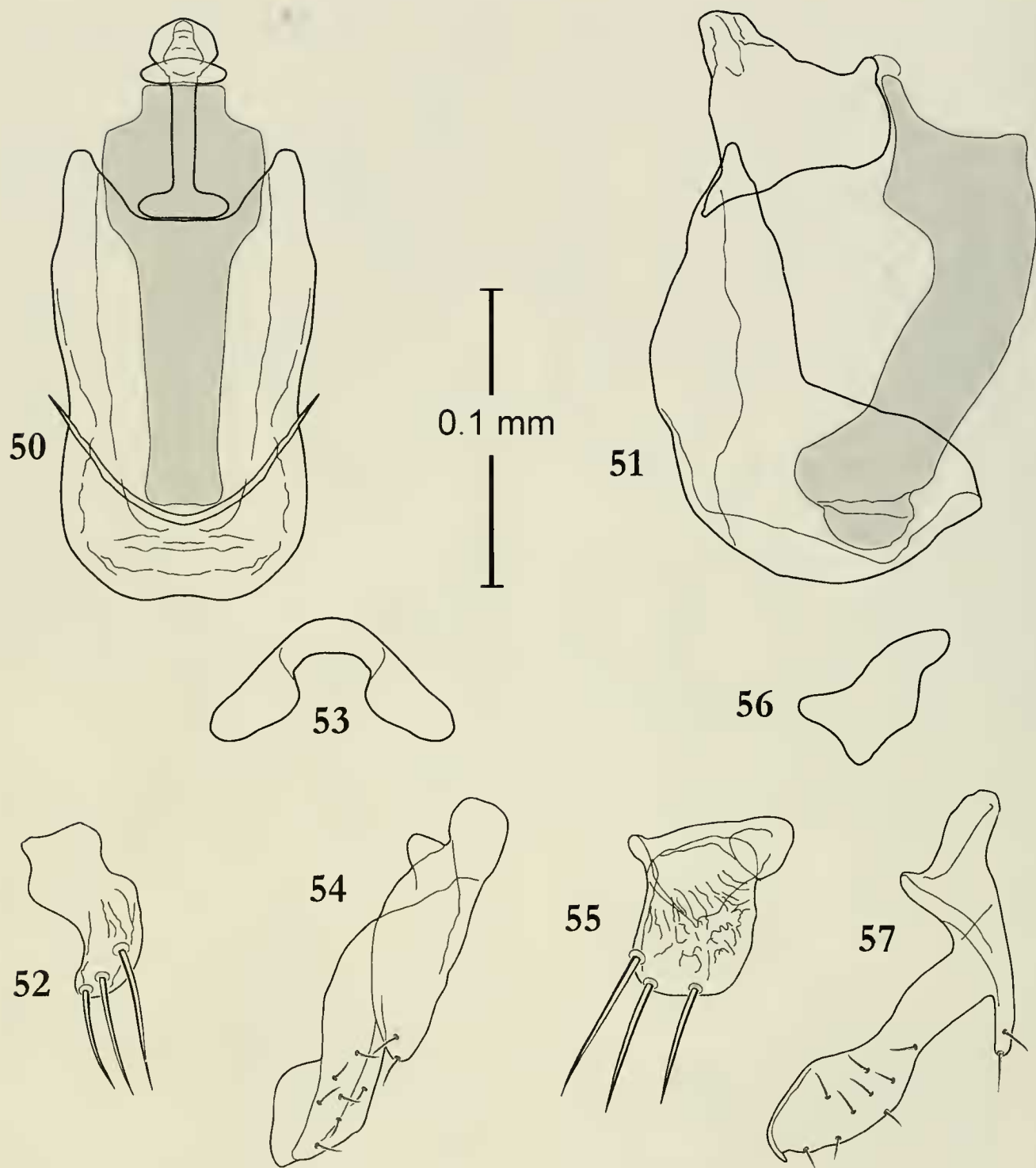
Other specimens examined.—Neotropical: ARGENTINA. *Corrientes*: Corrientes, 23 Feb 1927, R. C. Shannon (1 ♀; USNM).

BRAZIL. *São Paulo*: Mongaguá (24°06'S, 46°37'W), 24 Aug 1961, N. L. H. Krauss (2 ♂, 1 ♀; USNM).

CUBA. *Cienfuegos*: Aguada de Pasajero (22°23'N, 80°51'W), Feb 1915 (1 ♂, 3 ♀; USNM); Jardín Botánico (Soledad; 22°7.5'N, 80°19.2'W), Jan–Feb 1927, C. T. and B. B. Brues (2 ♂, 6 ♀; USNM). *Granma*: Cayamas, Baker (1 ♀; USNM). *Guantánamo*: Guantánamo, 10 Nov 1914, H. Skinner (1 ♀; paratype; ANSP). *Havana*: Havana, Baker (1 ♂; ANSP); Ojo de Agua (22°54.6'N, 82°29.1'W), 8 Dec 1994, W. N. Mathis (1 ♀; USNM). *Pinar del Río*: Soroa (22°47.7'N, 83°W), 4–6 Dec 1994, W. N. Mathis (1 ♂, 1 ♀; USNM).

DOMINICAN REPUBLIC. *Independencia*: Los Bolos (18°37.8'N, 71°39.2'W; 1370 m), 24 Mar 1999, W. N. Mathis (4 ♂, 17 ♀; USNM). *La Vega*: El Río (9.5 km E; 19°0.9'N, 70°33.5'W; 980 m), 6–24 May 1995, 1998, W. N. Mathis (11 ♂, 4 ♀; USNM); Jarabacoa (1–2 km S; 19°06.9'N, 70°37'W; 520 m), 8–21 May 1995, 1998, W. N. Mathis (5 ♂, 6 ♀; USNM); Río Camu (3.5 km NW La Vega; 19°13.7'N, 70°35.2'W; 100 m), 10 May 1995, W. N. Mathis (1 ♀; USNM). *Puerto Plata*: Río Camu (14 km E Puerto Plata; 19°11.9'N, 70°37.4'W), 17 May 1995, W. N. Mathis (3 ♂, 1 ♀; USNM).

JAMAICA. *Clarendon*: Grantham (18°09.3'N, 77°23.8'W; 340 m), 16 Apr 2000, W. N. Mathis (4 ♂, 13 ♀; USNM). *Manchester*: near Clandon (18°09'N, 77°28.3'W), 8 May 1996, D. and W. N. Mathis, H. Williams (1 ♀; USNM). *Portland*: Berridale (18°06.5'N, 76°20'W), Río Grande River, 25 Apr 2000, W. N. Mathis (4 ♂, 4 ♀; USNM). *St. Andrew*: Kingston (Fresh River), 24 Feb 1969, W. W. Wirth (1 ♀; USNM); Mavis Bank (1.7 km E; 18°02.4'N, 77°39.5'W; 575 m), Yallahs River, 21–22 Apr–1 May 2000, W. N.



Figs. 50–57. Structures of the male terminalia of *Cressonomyia skinneri* (Jamaica. Clarendon: Grantham (18°09.3'N, 77°23.8'W; 340 m)). 50. Aedeagus, phallapodeme, and hypandrium, ventral view. 51. Same, lateral view. 52. Pregonite, ventral view. 53. Subepandrial plate, ventral view. 54. Postsurstylus, ventral view. 55. Pregonite, lateral view. 56. Subepandrial plate, lateral view. 57. Postsurstylus, lateral view.

Mathis (13 ♂, 11 ♀; USNM); Mavis Bank (4.3 km SE; 18°01.4'N, 76°38.1'W; 480 m), Yallahs River, 22–23 Apr 2000, W. N. Mathis (11 ♂, 8 ♀; USNM); Silver Hill Gap (18°05.1'N, 76°41.1'W; 920 m), 26 Apr 2000, W. N. Mathis (2 ♂, 1 ♀; USNM); Wag Water River, 25 Feb 1969, W. W. Wirth (1 ♀; USNM). *St. Mary*: Annotto

Bay (marsh), 25 Feb 1969, W. W. Wirth (3 ♀; USNM).

MEXICO. *Chiapas*: Cacahoatan (7 km N), 22 Apr 1985, W. N. Mathis (1 ♂, 1 ♀; USNM); Union Juárez, 23 Apr 1983, W. N. Mathis (1 ♀; USNM). *Veracruz*: Tampico, 25 Feb 1972, D. Miller, F. Parker (1 ♂; USNM).





Fig. 58. Distribution map for *Cressonomyia skinneri*.

PANAMA. *Canal Zone*: Balboa, Oct 1946, N. L. H. Krauss (1 ♀; USNM). Taboga Island, 26 Feb 1912, A. Busck (1 ♂; USNM).

PUERTO RICO. Barranquitas, 5 Jun 1961, J. Maldonado (1 ♀; USNM). Bayamon, Jan 1899, A. Busck (3 ♂, 7 ♀; USNM). Dorado, 22 Nov 1964, S. M. Gaud, E. Medina (1 ♀; USNM). El Yunque (road 191; 1,380 ft), 28 Apr 1965, S. M. Gaud (1 ♀; USNM). Fajardo, Feb 1899, A. Busck (1 ♀; USNM). Jayuya (2 km E; Rio Saliente; 18°12.8'N, 66°33.9'W), 22 Sep 1995, D. and W. N. Mathis (2 ♂, 1 ♀; USNM). Maricao (4 km WNW; 18°10.7'N, 66°59.6'W), 21 Sep 1995, D. and W. N. Mathis (1 ♂; USNM). Mayaquez, Jan 1899, A. Busck (1 ♀; USNM). Rio Hoconuco (18°7.6'N, 67°2.6'W), 20 Sep 1995, D. and W. N. Mathis (3 ♂; USNM). Río Piedras (18°20'N, 66°3'W), 25 Apr–2 May 1965, S. M. Gaud, E. Medina (10 ♂, 24 ♀; USNM).

Río Piedras, San Gerardo, 24 Jan 1965, E. Medina, P. Medina (1 ♀; USNM). Rio Abajo Forest (road 621; 18°18'N, 66°41'W), 29 Feb 1965, S. M. Gaud (2 ♂, 3 ♀; USNM). San German, 23 Dec 1962, P. and P. Spangler (1 ♀; USNM). Toa Baja, 5 Apr 1915, G. Garb (2 ♀; ANSP). Utuado, Jan 1899, A. Busck (3 ♂, 7 ♀; USNM). Vieques Island, Feb 1899, A. Busck (1 ♀; USNM).

TRINIDAD. *Caroni*: Caroni (3 km W), 22 Mar 1985, G. F. and J. F. Hevel (3 ♂, 1 ♀; USNM); Chaguanas (near), 22 Mar 1985, G. F. and J. F. Hevel (3 ♂, 13 ♀; USNM). *St. Andrew*: Valencia (1 km W; 10°39'N, 61°13'W), Aripo River, 20 Jun 1993, W. N. Mathis (3 ♂, 3 ♀; USNM).

VENEZUELA. *Santa Rosa*: Barinas, Feb 1943, F. Anduze (2 ♀; USNM).

Distribution (Fig. 58).—*Nearctic*: USA (FL). *Neotropical*: Argentina (Corrientes), Brazil (São Paulo), Mexico (Chiapas, Veracruz), Panamá, Trinidad, Venezuela, West

Indies (Cuba, Dominican Republic, Jamaica, Puerto Rico).

Remarks.—The vertical, microtomentose, facial stripe is consistently evident but varies in its dimensions, sometimes extending dorsally to the ptilinal suture and sometimes becoming gradually wider basally, toward the oral margin.

Although we have not examined any specimens of this species from the Nearctic Region, Cresson (1942) reported a specimen from Florida. This record needs confirmation and is not included on our distribution map (Fig. 58).

The Brazilian (São Paulo, Mongaguá: 24°06'S, 46°37'W) and Argentinian (Corrientes: 27°28'S, 58°50'W) localities are disjunct and appear to be outliers (Fig. 58), which prompted us to re-examine the specimens, especially the male from Brazil. We dissected this male and confirmed its identification, and here suggest that the known distribution of this species represents a sampling artifact. Thus, we predict that with better sampling, the known distribution will include sites between southeastern Brazil and northern Argentina and northern South America. The specimen from Paraguay that Cresson (1946) listed was not located, but if accurately identified, it probably reflects the same pattern just noted.

#### THE *MERIDIONALIS* GROUP

Remarks.—The *meridionalis* group comprises a single species, *C. meridionalis*, which is somewhat similar externally to species of the *hinei* group. Structures of the male terminalia of this group are the most derived and divergent within *Cressonomyia* and are the primary basis for recognizing the group. The group is distinguished from the *aciculata* or the *hinei* groups by the following combination of characters (synapomorphies that characterize the *meridionalis* group and establish its monophyly are indicated by an \*): (1) fronto-orbital setae well developed; (2\*) arista with 4–5 dorsal rays; (3\*) face shorter, height 1.5× that of frons; (4\*) face polished; (5) darkened base of wing less extensive, at most occupying

basal ¼ of cell  $cua_1$ ; (6\*) presurstylus elongate, narrow, almost parallel sided, shallowly curved; (7\*) phallapodeme with portion that attaches to hypandrium projected; (8\*) gonite narrow; and (9\*) hypandrium flattened in lateral view.

#### *Cressonomyia meridionalis* (Cresson) (Figs. 59–73)

*Psilopa meridionalis* Cresson 1918: 52.

*Plagiopsis meridionalis*: Cresson 1946: 158 [generic combination, review, Neotropical fauna].

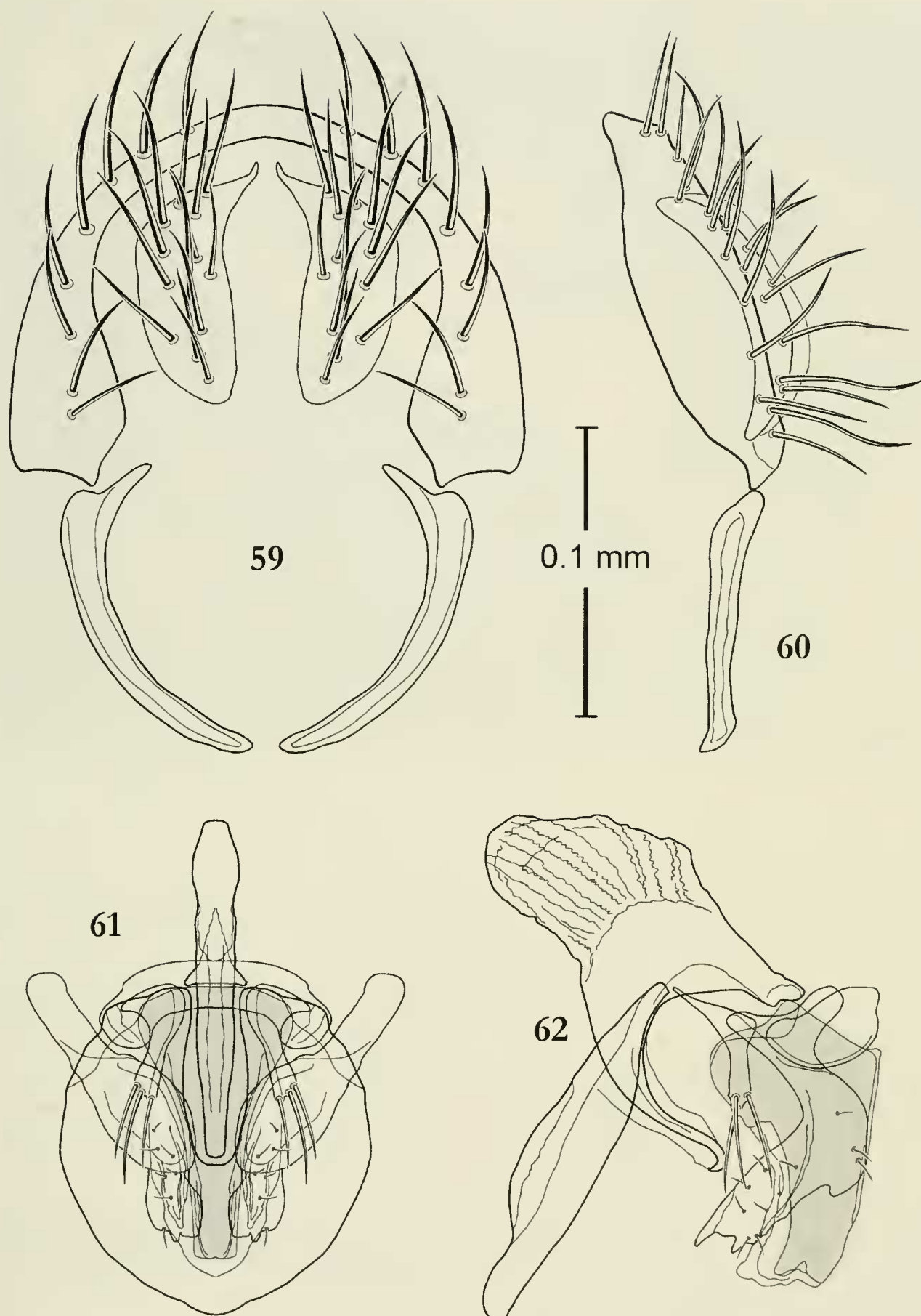
*Cressonomyia meridionalis*: Wirth 1968: 11 [generic combination, Neotropical catalog].—Mathis and Zatwarnicki 1995: 35 [world catalog].

Description.—This species is distinguished from congeners, especially of the *skinneri* group, by the following combination of characters: Small to moderately small shore flies, body length, 1.70–2.25 mm.

*Head*: Fronto-orbital setae well developed. Arista bearing 4–5 dorsal rays. Face and frons moderately arched in lateral view; face short, height 1.5× that of frons, polished, shiny.

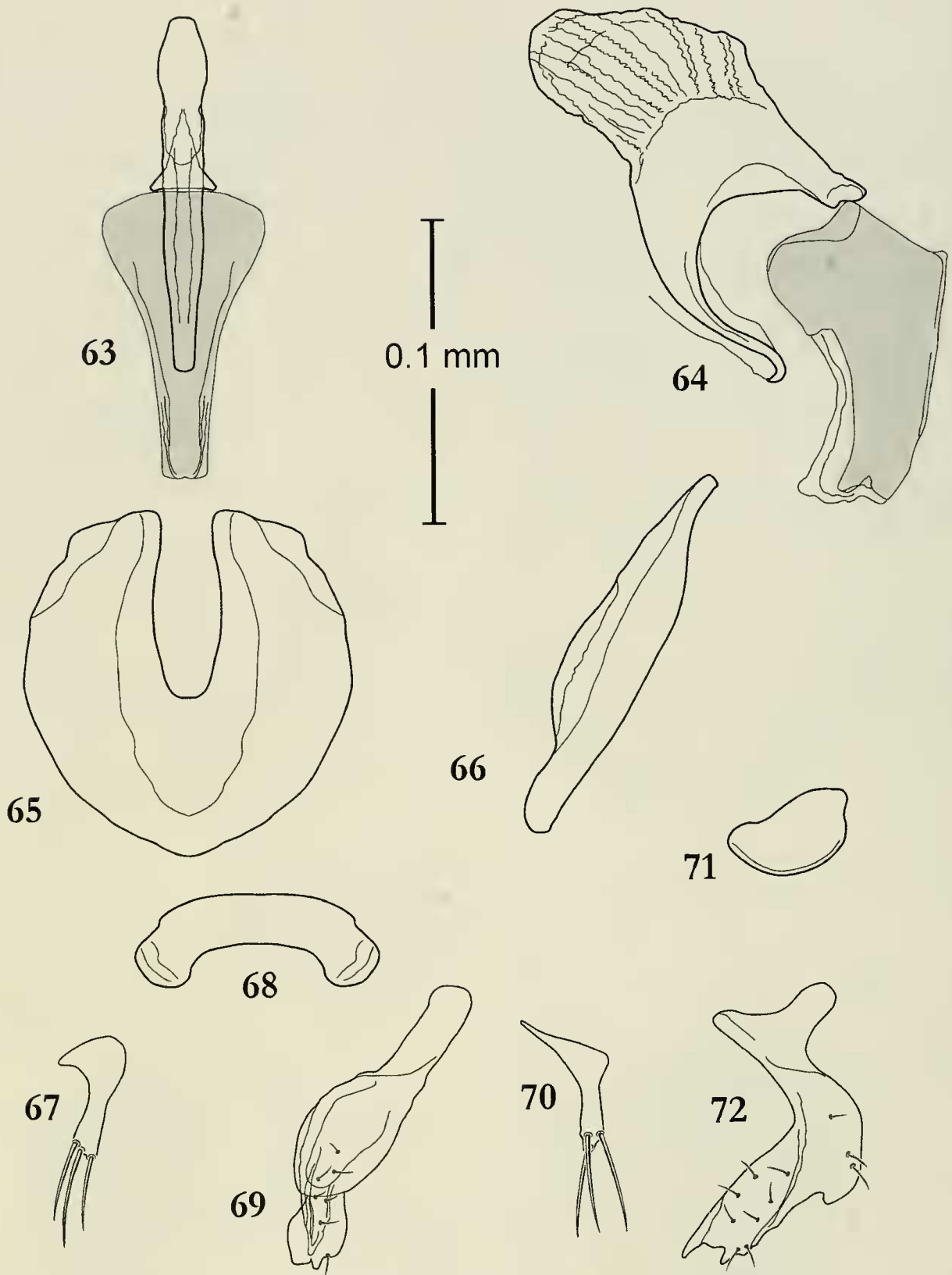
*Thorax*: Mesonotum smooth, shiny; darkened base of wing at most occupying basal ¼ of cell  $cua_1$ . Wing with costal vein ratio 0.98–1.0; M vein ratio 0.60–0.62. Tibiae mostly black.

*Abdomen*: Male terminalia (Figs. 59–72): Epandrium moderately broadly U-shaped in posterior view (Fig. 59), much wider ventrolaterally than dorsally; cerci (Fig. 59) somewhat rodlike, more rounded laterally, medial margin shallowly curved, pointed mediodorsally; presurstylus in posterior view sicklelike, gently curved, lacking medial notch and swelling, very slightly and gradually tapered to pointed apex, in lateral view as a long, narrow rod, only very slightly wider basally, apex slightly curved, almost truncate; postsurstylus in lateral view (Figs. 60, 72) longer than wide, angulate, bearing numerous setulae, at corner of angle slightly wider from small, ex-



Figs. 59–62. Structures of the male terminalia of *Cressonomyia meridionalis* (Costa Rica. San José: Río Savegre, San Gerardo de Dota ( $9^{\circ}39.5'N$ ,  $83^{\circ}51'W$ ; 2180 m)). 59, Epandrium, cerci, and presurstylus, posterior view. 60, Same, lateral view. 61, Aedeagus (shaded), phallapodeme, postsurstylus, pregonite, and hypandrium, ventral view. 62, Same, lateral view.





Figs. 63–72. Structures of the male terminalia of *Cressonomyia meridionalis* (Costa Rica. *San José*: Río Savegre, San Gerardo de Dota (9°39.5'N, 83°51'W; 2180 m)). 63, Aedeagus and phallapodeme, ventral view. 64, Same, lateral view. 65, Hypandrium, ventral view. 66, Same, lateral view. 67, Pregonite, ventral view. 68, Subepandrial plate, ventral view. 69, Postsurstylus, ventral view. 70, Pregonite, lateral view. 71, Subepandrial plate, lateral view. 72, Postsurstylus, lateral view.

ternal lobe, apex with 2 small dentate projections at each corner; pregonite (Figs. 61–62, 67, 70) moderately long, narrow, apical half rodlike, parallel sided, narrowly rounded apically, bearing 3 well-developed setu-

lae apically; aedeagus in ventral view (Figs. 61, 63) almost triangular, base much narrower than long, apical extension, like dorsal view of a bicycle seat, apex narrowly truncate, in lateral view (Figs. 62, 64) with



Fig. 73. Distribution map for *Cressonomyia meridionalis*.

swelling on basal third, swollen portion extended medially, rounded, apical half slightly tapered, apex shallowly concave; phallopodeme (Figs. 62–64) comparatively large with wide, asymmetrically extended keel, longest extension toward hypandrium; subepandrial plate in ventral view (Fig. 68) much wider than long, each lateral portion slightly curved posteriorly, bluntly rounded, in lateral view (Fig. 71) slightly tapered to rounded apex; hypandrium in lateral view (Fig. 62) very shallowly pocketlike, somewhat flattened, in ventral view (Fig. 61) suboval, lacking anterior and posterior projections.

Type material.—The holotype male of *Psilopa meridionalis* Cresson is labeled “Cartago 17V’09 [17 May 1909] C[osta].Rica PPCalvert/♂/TYPE 6126 [red; number handwritten]/TYPE *Psilopa meridionalis* E T CRESSON JR [red; “TYPE” written along left margin of label].” The

holotype is double mounted (minuten in a thin, rectangular piece of cardboard), is in good condition (slightly dusty), and is deposited in the ANSP (6126). The type locality, Cartago, is in the province of Cartago.

Other specimens examined.—Neotropical: COSTA RICA. *Cartago*: Cartago, 17 May 1909, P. P. Calvert (1 ♂, 1 ♀; paratypes; ANSP); El Alto, Laguna de Ochomogo (9°53’N, 83°57’W; 1510 m), 7 Jul 1909, P. P. Calvert (1 ♀; ANSP); Near Tierra Blanca (Río Toyogres; 9°50’N, 83°55’W), 6 Apr 1910, P. P. Calvert (2 ♂, 2 ♀; ANSP); Trinidad (9°41.3’N, 83°54’W; 2530 m), 29 Jun 2001, A. Freidberg (1 ♂; USNM). *Heredia*: Santo Domingo (INBIO Parque; 9°58.4’N, 84°05.6’W), 23 Jun 2001, W. N. Mathis (2 ♂; USNM). *San José*: La Caja (8 km W San José), 1930, H. Schmidt (5 ♂, 1 ♀; USNM); Río Savegre, Cabinas de Quetzal (9°33.9’N, 83°48’W; 2,270 m),

7–8 Aug 2001, D. and W. N. Mathis (8 ♂, 2 ♀; USNM); Río Savegre, San Gerardo de Dota (9°39.5'N, 83°51'W; 2,180 m), 7–8 Aug 2001, D. and W. N. Mathis (22 ♂, 8 ♀; USNM).

MEXICO. *San Luis de Potosí*: Ciudad del Maiz (40–50 mi NW), 20 Nov 1948, E. S. Ross (1 ♀; USNM).

Distribution (Fig. 73).—*Neotropical*: Costa Rica (Cartago, Heredia, San José), Mexico (San Luis de Potosí).

Remarks.—The structures of the male terminalia, the presurstylus in particular, are quite remarkable and represent a major departure from other species in *Cressonomyia*. The narrow, almost parallel-sided, sickle-shaped presurstylus is quite unique, and readily identifies this species. Otherwise, however, we did not find this species to differ greatly from congeners.

#### ACKNOWLEDGMENTS

We gratefully acknowledge the assistance and cooperation of many organizations and individuals who contributed to the field work and production of this paper. To David A. Grimaldi (AMNH), Jon K. Gelhaus and Jason D. Weintraub (ANSP), Richard W. Baumann (BYU), Chen Young (CPM), Manuel Zumbado (INBio), Philip D. Perkins (MCZ), Ruth Contreras-Lichtenberg (NMW), Peter W. Kovarik (OHSU), and their institutions, who loaned specimens, we express our sincere thanks.

Hollis B. Williams provided technical support and produced the maps. For reviewing a draft of this paper, we thank Stephen D. Gaimari and Allen L. Norrbom. We also express thanks to F. C. Thompson who advised us on nomenclatural issues and to Manuel Zumbado who converted Lambert coordinates for the Costan Rican grid system into standard latitude and longitude. In 1995, 1996, and 1998, field work on the West Indies was funded in large measure by grants from the Biodiversity Program (Biotic Surveys and Inventories, BSI), National Museum of Natural History, Smithsonian Institution (Lynne R. Parenti, former chair, George R. Zug, chair). Field work in Bo-

livia was also supported by BSI. Field work on the West Indies and/or in Bolivia was greatly expedited through the able and pleasant assistance of N. Dianne Mathis, Amnon Freidberg, Stephen D. Gaimari, Hollis B. Williams, Kelvin Guerrero, Daniel E. Pérez-Gelabert, and Oliver S. Flint, Jr. Field work in Guyana was supported by the Smithsonian Institution's Biological Diversity of the Guianas Program (publication number 72; Vicki A. Funk, Director; Carol L. Kelloff, Coordinator).

This is contribution number 653 from the Caribbean Coral Reef Ecosystems (CCRE), Smithsonian Institution.

#### LITERATURE CITED

- Arnaud, P. H., Jr. 1958. *Cressonomyia* new name for *Plagiopsis* Cresson Preoccupied (Diptera: Ephydriidae). *Entomological News* 69(1): 24.
- Brauer, F. and J. E. von Bergenstamm. 1889. Die Zweiflügler des Kaiserlichen Museums zu Wien. IV. Vorarbeiten zu einer Monographie der Muscaria Schizometopa (exclusive Anthomyidae). Pars I. Denkschriften der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe. Wien 56(1): 69–180.
- Coquillett, D. W. 1900. Report on a collection of dipterous insects from Puerto Rico. *Proceedings of the United States National Museum* 22(1198): 249–270.
- Cresson, E. T., Jr. 1918. Costa Rican Diptera collected by Philip P. Calvert, Ph.D., 1909–1910. Paper 3. A report on the Ephydriidae. *Transactions of the American Entomological Society* 44(1): 39–68.
- . 1922. Descriptions of new genera and species of the dipterous family Ephydriidae.—V. *Entomological News* 33(5): 135–137.
- . 1925. Studies in the dipterous family Ephydriidae, excluding the North and South American faunas. *Transactions of the American Entomological Society* 51(3): 227–258.
- . 1934. Descriptions of new genera and species of the dipterous family Ephydriidae.—XI. *Transactions of the American Entomological Society* 60: 199–222.
- . 1942. Synopses of North American Ephydriidae (Diptera) I. The subfamily Psilopinae, with descriptions of new species. *Transactions of the American Entomological Society* 68: 101–128.
- . 1944. Synopses of North American Ephydriidae (Diptera). Parts IA and II. *Transactions of the American Entomological Society* 70: 159–180.
- . 1946. A systematic annotated arrangement of the genera and species of the Neotropical Ephydriidae (Diptera) I. The subfamily Psilopinae.



- Transactions of the American Entomological Society 71: 129–163.
- Curran, C. H. 1928. Diptera or two-winged flies. *In* Curran, C. H., C. P. Alexander, C. R. Twinn, E. P. Van Duzee, Scientific Survey of Porto Rico and Virgin Islands. *Annals of the New York Academy of Science* 11(1): 1–118.
- Gowdey, C. C. 1926. *Catalogus Insectorum Jamaicaensis*. Department of Agriculture, Jamaica. *Entomological Bulletin* 4(1–2): xiv+114 pp.
- Hendel, F. 1930. Die Ausbeute der deutschen Chaco-Expedition 1925/26. Diptera. XIX. Ephydridae. *Konowia* 9(2): 127–155.
- Hine, J. S. 1904. On Diptera of the family Ephydridae. *The Ohio Naturalist* 4(3): 63–65.
- Johnson, C. W. 1913. Insects of Florida. I. Diptera. *Bulletin of the American Museum of Natural History* 32(3): 37–90.
- . 1919. A revised list of the Diptera of Jamaica. *Bulletin of the American Museum of Natural History* 41(8): 421–449.
- Loew, H. 1862. *Monographs of the Diptera of North America*. Part 1. Smithsonian Institution, Smithsonian Miscellaneous Collections 6(141): 1–221.
- . 1878. Neue nordamerikanische Ephydrinen. *Zeitschrift für die Gesamten Naturwissenschaften* 3(51): 192–203.
- Mathis, W. N. 1986. Studies of Psilopinae (Diptera: Ephydridae). I: A revision of the shore fly genus *Placopsidella* Kertész. *Smithsonian Contributions to Zoology* 430: iv+30 pp.
- Mathis, W. N. and T. Zatwarnicki. 1990a. A revision of the Western Palearctic species of *Athyroglossa* (Diptera: Ephydridae). *Transactions of the American Entomological Society* 116(1): 103–133.
- . 1990b. Taxonomic notes on Ephydridae (Diptera). *Proceedings of the Biological Society of Washington* 103(4): 891–906.
- . 1995. A world catalog of the shore flies (Diptera: Ephydridae). *Memoirs on Entomology, International*, 4: vi+423 pp.
- McAlpine, J. F. 1981. Morphology and terminology—Adults. *In* McAlpine, J. F. et al., eds. *Manual of Nearctic Diptera*, 1: 9–63. Ottawa. [Volume I is Monograph 27 of Research Branch Agriculture Canada.]
- Osten Sacken, C. R. 1903. Record of my life work in entomology. University Press, Cambridge, Massachusetts, ix+204 pp.
- Ragués, P. V. 1908. Dípteros Cubanos. *Anales de la Academia de Ciencias de la Habana* 45: 302–319.
- Schiner, I. R. 1868. Diptera. (Article 1). *In* (Wüllerstorff-Urbair, B. von, in charge). *Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. von Wüllerstorff-Urbair*. Zoologischer Theil. Karl Gerold's Sohn, Wien. 2(1B), 388 pp.
- Townsend, C. H. T. 1911. Announcement of further results secured in the study of muscoid flies. *Annals of the Entomological Society of America* 4(2): 127–152.
- Williston, S. W. 1896. On the Diptera of St. Vincent (West Indies). *The Transactions of the Entomological Society of London* 1896: 253–446.
- . 1897. Diptera Brasiliana. Part IV. *Kansas University Quarterly Series A* 6: 1–12.
- . 1908. *Manual of North American Diptera*. Third edition. New Haven, Connecticut, 405 pp.
- Wirth, W. W. 1965. Family Ephydridae, pp. 734–759. *In* Stone, A., C. W. Sabrosky, W. W. Wirth, R. H. Foote, and J. R. Coulson, eds. *A Catalog of the Diptera of America North of Mexico*. United States Department of Agriculture, Agriculture Handbook No. 276: iv+1696 pp.
- . 1968. 77. Family Ephydridae, pp. 1–43. *In* Papavero, N., ed. *A Catalogue of the Diptera of the Americas South of the United States*. Departamento de Zoologia, Secretaria da Agricultura. São Paulo.
- Wolcott, G. N. 1924 [1923]. "Insectae Portoricensis." A preliminary annotated check-list of the insects of Porto Rico, with descriptions of some new [sic] species. *The Journal of the Department of Agriculture of Porto Rico* 7(1): 1–313.
- . 1936. Insectae Borinquenses. A revised annotated check-list of the insects of Puerto Rico. *The Journal of Agriculture of the University of Puerto Rico* 20(1): 1–600.
- Zatwarnicki, T. 1992. A new classification of Ephydridae based on phylogenetic reconstruction (Diptera: Cyclorhapha). *Genus* 3(2): 65–119.
- . 1996. A new reconstruction of the origin of eremoneuran hypopygium and its implications for classification (Insecta: Diptera). *Genus* 7(1): 103–175.